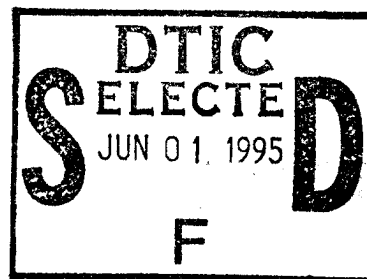

ARCHEOLOGICAL SURVEY OF 1993 - 1994 TIMBER HARVESTING AREAS, LONGHORN ARMY AMMUNITION PLANT, HARRISON COUNTY, TEXAS

by
Maynard B. Cliff
Steven M. Hunt
Floyd Kent
Melissa M. Green
Duane E. Peter



MISCELLANEOUS REPORT OF INVESTIGATIONS
NUMBER 71



GEO-MARINE, INC.



US Army Corps
of Engineers
Fort Worth District

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<p>A cultural resource survey of five areas at Longhorn Army Ammunition Plant was carried out in 1993. The work was undertaken to identify and inventory any cultural resource properties that might be contained within the 333 ha (823 acres) that were to undergo timber harvesting.</p> <p>As a result of the investigations, four archeological sites and five nonsite localities were identified. Site 41HS240 is identified as being prehistoric in age and sites 41HS396, HS539, and HS540 date to the historic era in northeastern Harrison County, Texas. Historic sites 41HS396 and HS540 are recommended as being ineligible for inclusion in the NRHP and no further work is required. Prehistoric site 41HS240 and historic site HS539 are considered to retain some research potential. Therefore, it is recommended that they be considered to be of unknown eligibility for inclusion in the NRHP and that additional data be collected to complete the evaluation for their NRHP eligibility. The nonsite localities, which represent isolated prehistoric or historic finds, are by definition ineligible for inclusion in the NRHP and no further work is recommended for them.</p>			
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TIMBER HARVESTING AREAS,
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HARRISON COUNTY, TEXAS**

by
Maynard B. Cliff, Ph.D.
Steve M. Hunt
Floyd Kent
Melissa M. Green
and
Duane E. Peter

Principal Investigator
Duane E. Peter

Prepared for
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MISCELLANEOUS REPORT OF INVESTIGATIONS,
NUMBER 71

Geo-Marine, Inc.
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EXECUTIVE SUMMARY

This report is the result of a cultural resource survey, carried out in 1993, of portions of the Longhorn Army Ammunition Plant (LHAAP) located in northeastern Harrison County, Texas. This work was undertaken in order to identify and inventory the cultural resource properties contained in five timber management units, totalling approximately 333 ha (823 acres), within the boundaries of the LHAAP, and evaluate their potential for inclusion in the National Register of Historic Places (NRHP).

The present survey resulted in the identification and recording, or rerecording, of four cultural resource properties (41HS240, 41HS396, 41HS539, and 41HS540) and five nonsite localities. Only one of these properties (41HS240) is identified as being prehistoric in age, while the remaining three all date to the historic period. Two of the cultural resource properties (41HS396 and 41HS540) are recommended to be ineligible for inclusion in the NRHP and no further work is recommended for them. Site 41HS240 and site 41HS539 are believed to possibly retain some research potential and are recommended to be of unknown eligibility for inclusion in the NRHP, and additional data collection is recommended in order to complete the evaluation of their NRHP eligibility. The nonsite localities, which represent largely isolated prehistoric or historic finds, are by definition ineligible for inclusion in the NRHP and no further work is recommended for them.

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ABSTRACT

In October of 1993, Geo-Marine, Inc., under contract to the U.S. Army Corps of Engineers, Fort Worth District, conducted cultural resources investigations within various areas of the Longhorn Army Ammunition Plant (LHAAP) in Harrison County, Texas, as part of an ongoing program to identify and evaluate all of the cultural resource properties within the facility, in accordance with and in partial fulfillment of the Army's obligation under the National Historic Preservation Act of 1966 (PL 89-665), as amended; the Archeological and Historical Preservation Act of 1974 (PL 93-291), as amended; Executive Order No. 11593, "Protection and Enhancement of the Cultural Environment"; and Army Regulation 420-40, "Historic Preservation." This work involved a systematic pedestrian survey of five timber management units, totaling approximately 333 ha (823 acres), on the LHAAP, and selective shovel testing of high probability site areas and areas with dense ground cover.

As a result of the systematic survey within portions of the LHAAP, two previously recorded and two previously unknown archeological sites, and five nonsite localities were identified. Of the four archeological sites which were identified, one is presently identified as being entirely prehistoric, while the remaining three are historic sites. The single prehistoric site has been previously recorded as the Harrison Bayou site (41HS240) and was revisited and reevaluated for this survey. This site has played a significant role in the history of Caddoan studies in Northeast Texas, having provided ceramic collections which aided first the identification of the Caddoan Ceramic Tradition, and subsequently the definition of the Bossier focus. Despite having been adversely impacted by installation activities, the site may retain some research potential. Of the remaining three sites, one (41HS396) has been previously recorded and was judged to be ineligible for inclusion in the National Register of Historic Places (NRHP). The present survey did not alter this recommendation. The remaining two historic sites (41HS539 and 41HS540) have not been previously evaluated and appear to date to the late nineteenth and early twentieth centuries. Site 41HS540 appears to have been heavily impacted by LHAAP activities, with the result that it also is recommended as being ineligible for inclusion in the NRHP. Site 41HS539, however, may have some research potential. It is therefore recommended that sites 41HS240 and 41HS539 be considered of unknown eligibility for inclusion in the NRHP and protected until the evaluation process can be completed.

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The authors would like to express their appreciation to the many individuals and organizations who contributed to the successful completion of this report. The personnel of the U.S. Army Corps of Engineers, Fort Worth District, were particularly supportive of our efforts and provided both administrative support and guidance. Mr. Tim Dalbey served as the Contractor's Representative for this Delivery Order and provided both constructive direction and useful suggestions. Mr. Dan McGregor gave us the benefit of his previous experience at the LHAAP, as well as in East Texas in general. Also, we would like to thank the personnel of the LHAAP who helped make our period of fieldwork as easy as possible. We would especially like to thank Mr. Nathan, chief engineer, for his cooperation; Mr. Paul Parrot, Chief of Plant Security, and Officer Mosely for their assistance in securing security badges and camera passes and in expediting the survey crew's access to various areas on the plant; and to Mr. Tom Brantley, Forester, who was very helpful with directions and information concerning some site locations.

In the field, the diligence and dedication of the able crew members were essential to the successful completion of the fieldwork. These included Mr. George Brown, Mr. Mike Lewis, and Ms. Joanna Hunziker. Mr. Floyd Kent acted as Field Supervisor. In the laboratory, artifact analysis and data input were undertaken by the staff of Geo-Marine, Inc., under the direction of Dr. Cliff and Ms. Marianne Marek, Laboratory Director. The prehistoric lithic materials were analyzed and described by Mr. Bob Vance and Dr. Cliff. Ms. Melissa Green analyzed and described the historic artifacts. Computer graphics were produced by Ms. Sandy Carr. Text and copy editing and final report production were overseen by Ms. Sharlene Allday.

CHAPTER 1

INTRODUCTION

This report presents the results of a cultural resource survey of five timber management units, comprising approximately 333 ha (823 acres) on the Longhorn Army Ammunition Plant (LHAAP) in northeastern Harrison County, Texas, conducted during the fall of 1993 under Delivery Order 012, Contract DACW63-90-D-0006 with the U.S. Army Corps of Engineers, Fort Worth District (Figure 1). The LHAAP is a government-owned, contractor-operated facility under the jurisdiction of the United States Army Armament, Munitions and Chemical Command (AMCCOM), which is part of the Army Materiel Command (AMC). As a federal entity in control of almost 3,429 ha (8,493 acres) in Harrison County, federal laws and regulations outline the responsibilities of the LHAAP for the management of all cultural resources under its ownership or control. These include, but are not restricted to, the National Historic Preservation Act of 1966, as amended (PL 102-575); the Archeological and Historic Preservation Act of 1974 (PL 93-291); Executive Order 11593, "Protection and Enhancement of the Cultural Resources"; and Army Regulation 420-40, "Historic Preservation."

An archeological overview and management plan for the LHAAP was originally produced in 1985 by Woodward-Clyde Consultants and their subcontractor, Heartfield, Price and Greene (Dieste et al. 1985). Then, in 1990, Geo-Marine, Inc. (GMI), produced an assessment of the cultural resources within the LHAAP, based on a limited reconnaissance of the plant (Peter and Stiles-Hanson 1990). In this assessment, Peter and Stiles-Hanson recommended the preparation of an Historic Preservation Plan (HPP) for the plant, and that the entire plant be surveyed for significant cultural resources using an "incremental survey program related to management needs" (Peter and Stiles-Hanson 1990:53-54). The first step in implementing these recommendations was taken in 1989, when GMI surveyed 323 ha (800 acres) on the LHAAP. In 1991, GMI surveyed an additional 299 ha (740 acres) and in 1992 another 161 ha (400 acres). The results of all of these surveys have been presented in a previous report (Cliff and Peter 1992).

The present report is the result of fieldwork carried out by GMI in October of 1993. This work resulted in the recording of two previously unknown cultural resource sites and the rerecording of two already known sites. In addition, five nonsite localities were identified. In all, 30 person-days of effort were expended, with 796 shovel tests excavated over a period of nine days. Three of the four sites were pre-military historical (41HS396, 41HS539, and 41HS540), while the fourth was the Harrison Bayou site (41HS240), a prehistoric site of some significance in the development of Caddoan studies in East Texas and Louisiana. Five nonsite localities were also located, three of historic date, one of prehistoric date, and one with both historic and prehistoric material. These localities consisted of isolated artifacts and modern

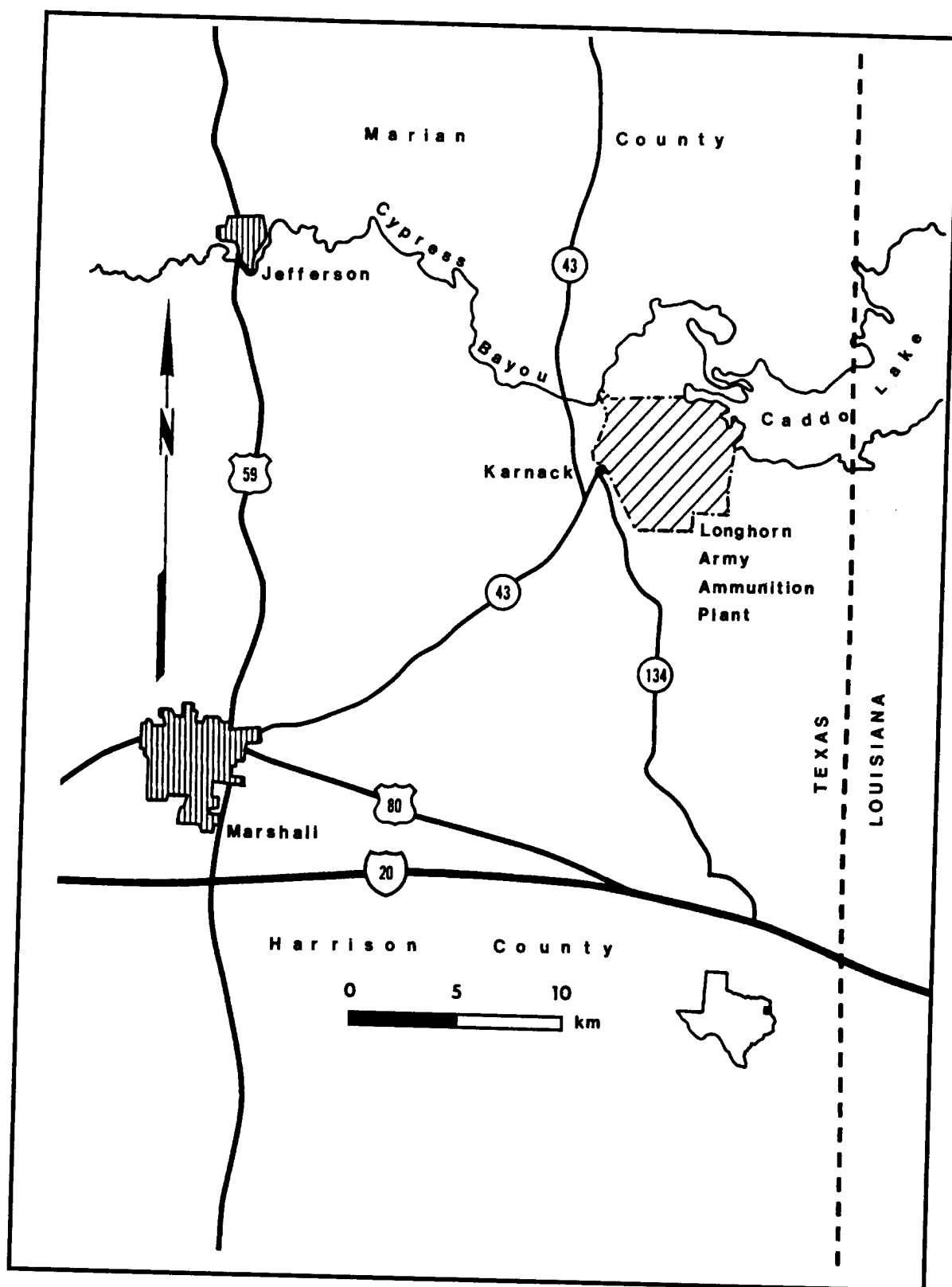


Figure 1. General location map of the Longhorn Army Ammunition Plant, Harrison County, Texas.

or post-1940 refuse. None of these localities contained any significant subsurface archeological deposits and all are recommended to be ineligible for inclusion in the National Register of Historic Places (NRHP).

The present report is organized into five chapters. The first part of Chapter 2 presents the modern environmental setting for the study area, along with an overview of the Holocene paleoenvironment as presently understood. The cultural setting of the LHAAP and the surrounding area is presented in the second part of Chapter 2, which includes a summary of previous archeological research conducted in the area and a summary of the cultural historical framework for the region. Much of this information has been previously presented by Dieste et al. (1985), Peter and Stiles-Hanson (1990), and Cliff and Peter (1992). Chapter 3 presents the conceptual framework which guided these research efforts, as well as the research methodologies for the intensive survey and the artifact analyses. Chapter 4 presents descriptions of the cultural resource sites and localities recorded by the survey. Finally, a summary of the findings along with site assessments and recommendations are presented in Chapter 5. References cited and appendices follow. Definitions of prehistoric artifact classes are included as Appendix A, while artifact data tables for the prehistoric and historic sites are presented in Appendices B and C, respectively.

CHAPTER 2

PROJECT SETTING

The following sections are intended to provide a general summary of both the environmental and cultural-historical context of the Longhorn Army Ammunition Plant (LHAAP) in East Texas. Much of the information contained in this chapter has been previously presented in Dieste et al. (1985), Peter and Stiles-Hanson (1990), and Cliff and Peter (1992).

ENVIRONMENTAL BACKGROUND

Physiography

The LHAAP is located in the northeastern portion of Harrison County, in extreme eastern Texas near the border with Louisiana. It is adjacent to the town of Karnack to the west, while Caddo Lake, originally a natural impoundment on the Big Cypress drainage, forms its northeastern boundary (see Figure 1). This area lies within the Gulf Coastal Plain Province of North America and is within the Sabine Uplift (Murray 1960; Roland 1976). Topographically, the facility is characterized by gently undulating hills, upland flats, and marshy alluvial flats. Although the entire area once consisted of upland ridges and hills dissected by intermittent and permanent streams, the impoundment of Caddo Lake within the past millennium has resulted in the formation of the alluvial flats and marshy bottomlands within the lake's tributary drainages. The gently rolling topography of the facility varies in elevation from about 50 to 105 m (170-335 ft) above mean sea level (U.S. Department of the Interior 1978a, 1978b), with the area of greatest relief limited to the extreme northwestern portion of the plant.

Geology and Soils

The majority of the exposed sediments present within the LHAAP are Early Eocene in age and have been classified within the Wilcox Group of carbonaceous sands, silts, and clays (American Association of Petroleum Geologists 1975). The nature of these sediments has contributed to the formation of fine sandy loam upland soils, while the slightly rolling to hilly topography which characterizes the plant area results from the differential resistance of the underlying bedrock to weathering (Van Duyne and Byers 1913:6).

Archeological Survey of Timber Harvesting Areas: LHAAP

Exposures of the Wilcox Group have been found to contain sandstone concretions and pieces of silicified wood which may have served as raw material in the production of prehistoric lithic tools (Sellards et al. 1932). Information supplied previously by LHAAP personnel suggests that these types of raw material are available in quantity within the confines of the plant area. High quality chert and quartzite gravels from Pleistocene terrace deposits and gravel bars were also available on the major streams throughout East Texas and were a probable source of raw material for lithic artifact production (Banks 1990). The area of Central Arkansas was a probable source for the more exotic raw material types (i.e., novaculite, greenstone, slate, and granite) which have been recovered from archeological sites within the immediate vicinity (Gibson 1970).

In general, there are two major classes and one minor class of soils present within the LHAAP. The major classes are: (1) loamy floodplain or lakeshore soils of alluvial origin, and (2) loamy or sandy upland soils which originated from the shales and clays of the Wilcox formation. The third, minor class of soils consists of those occurring on upland or ancient terraces scattered across the base (Golden 1988).

Climate

Climatically, the LHAAP is located within a zone of humid subtropical climate which extends throughout much of the southeastern United States. Winter, spring, and fall temperatures are mild, while during the summer, average high temperatures are above 36° C (98° F) and high humidity levels are characteristic. Precipitation occurs primarily in the form of rainfall, predominantly during the winter and spring months, with the mean yearly precipitation being between about 1,100 and 1,300 mm (45-50 in). Tropical depressions moving inland from the Gulf Coast are occasionally responsible for heavier rains in the late summer or fall (Dieste et al. 1985).

Flora and Fauna

As a number of authors have previously noted (Dieste et al. 1985:2-5 to 2-8; Gibson 1970:11-14), the LHAAP area contains a variety of microenvironments which offer a rich abundance of plant and animal resources. Overall, the vegetation of the facility is characterized by a mixed pine and oak overstory (Arbingast and Kennamer 1963), but this fails to do justice to the diversity of the biological resources in the area. As part of their 1990 cultural resources assessment of the LHAAP, Peter and Stiles-Hanson (1990) used topography, floral ecosystems, and soil profiles to divide the LHAAP into four environmental/topographic zones (Table 1).

Paleoclimatic Reconstruction

The prehistoric climatic history of the LHAAP area, as reconstructed by Peter and Stiles-Hanson (1990), consists of a gradual warming trend following the end of the Pleistocene, which was interrupted by a period of warmer temperature than today about 4,000 to 8,000 years ago (Bryan 1988; Delcourt and Delcourt 1985; Howard and Fields 1988; and Kelley et al. 1988). It is presently believed that during what Delcourt and Delcourt (1985:12-13) term the Late Wisconsin Full-glacial Interval (23,000-16,500 B.P.), climatic conditions were considerably cooler and more mesic than today (Bryan 1988:10). During this period, the general LHAAP area fell on, or close to, an ecotone between a narrow band of mixed conifer-northern hardwoods forest to the north and a more extensive Southeastern Evergreen Forest to the south (Delcourt and Delcourt 1985:Figure 7a, 15-16). A short distance to the north, about where the Sulphur River is today, was the beginning of true boreal forest, similar to that which today characterizes eastern Canada.

Table 1
Modern Environmental Zones on the Longhorn Army Ammunition Plant (after Peter and Stiles-Hanson 1990)

Zone	Elevation	Topography	Soils	Hydrology	Floral Associations	Faunal Resources
1: Dissected Uplands	above 65 m (220 ft)	Rolling and hilly.	Upland soils, typically Scottsville very fine sandy loam and Eastwood very fine sandy loam.	Intermittent stream channels produce temporary marsh situation rather than flowing streams in lower elevations.	Overall predominance of pine forest; although variety of oaks, elms, pecan, and sweetgum dominant in lower elevations, with understory of plum, dogwood, buckeye, hackberry, hawthorn, grapes, and blackberry.	Deer, opossum, fox, squirrel, black bear, cougar, bobcat, and wild turkey.
2: Upland Flat	55-65 m (180-220 ft)	Relatively flat, with very gentle elevation rise from southeast to northwest.	Upland soils predominate, specifically Scottsville very fine sandy loam.	Single drainage system with very little downcutting.	Mixed pine/hardwood; variety of oaks, elms, pecan, and sweetgum dominant, with understory of plum, dogwood, buckeye, hackberry, hawthorn, grapes, and blackberry in lower elevations; pine/oak overstory at higher elevations.	Deer, opossum, fox, squirrel, black bear, cougar, bobcat, and wild turkey.
3: Eroded Upland	55-65 m (180-215 ft)	Deeply entrenched aggrading stream valleys, with remnants of upland flats in interfluvies above 60 m.	Generally upland soils (specifically Scottsville very fine sandy loam), with alluvial soils at lower elevations, especially Sardis- Mathiston loams, Socagee silty clay loam, and Iuka fine sandy loam.	Three actively flowing streams, with small intermittent tributaries active in wet season.	Mixed pine/hardwood; variety of oaks, elms, pecan, and sweetgum dominant, with understory of plum, dogwood, buckeye, hackberry, hawthorn, grapes, and blackberry in lower elevations; also more water-tolerant species at lower elevations; pine/oak overstory at higher elevations.	Deer, opossum, fox, squirrel, black bear, cougar, bobcat, and wild turkey.
4: Alluvial Bottomlands	below 55 m (180 ft)	Bottomlands or marshlands.	Flooded or submerged soils, especially Cypress clay loam.	Includes shoreline of Caddo Lake and floodplains of all four drainages within the LHAAP.	Generally water-tolerant species; water elm and cypress overstory adjacent to lake; floodplain areas dominated by willow oak, with cypress, water oak, and button bush.	Gray squirrels, raccoons, nesting avian species, deer, ducks, turtles, fish, and shellfish.

Vegetational response to the onset of what Delcourt and Delcourt (1985:18-19) term the Late Wisconsin Late-glacial Interval (16,500-12,500 B.P.) in the vicinity of the LHAAP must have been almost immediate, given its location close to the southern full-glacial limit of the boreal forest. During what Delcourt and Delcourt (1985:19) term the Early-Holocene Interval (12,500-8,500 B.P.), cool-temperature, mesic tree species became dominant throughout much of the mid-latitudes of the southeastern United States. Reconstructed vegetation maps suggest that the LHAAP area at this time was located in the Southeastern Evergreen Forest (Delcourt and Delcourt 1985:Figure 7b). The succeeding Middle-Holocene Interval (Delcourt and Delcourt 1985:19-20), also known as the Hypsithermal (8,500-4,000 B.P.), was a period of warming and drying which resulted in the expansion of prairie at the expense of forest (Delcourt and Delcourt 1985:19; Bryan 1988; Howard and Fields 1988). By 5,000 years ago, the Southeastern Evergreen Forest had shifted from being dominated by xeric species of oak and hickory to being dominated by species of southern pine (Delcourt and Delcourt 1985:Figure 7c, 20). By 4,000 years ago, a slight cooling trend and an increase in moisture resulted in the establishment of modern conditions, with minor fluctuations, subsequent to the beginning of the Christian era (Delcourt and Delcourt 1985:20-21; Bryan 1988; Howard and Fields 1988). At this time, the forest in the LHAAP area would have been dominated by various species of southern pine with the establishment of modern plant communities in the area. A serious decrease in moisture may have begun between the eleventh and thirteenth centuries A.D., especially notable in pollen profiles and floodplain stratigraphy from northeastern Texas and southeastern Oklahoma (Bruseth et al. 1987:43-47; Peter and Jurney 1988:24-26). This may have affected the LHAAP area either directly, as a period of decreased moisture, or indirectly, through the formation of the Great Raft on the Red River to the south and east.

The environment of the LHAAP area apparently was radically affected by the presence of the Great Raft on the upper portion of the Red River in Louisiana. The Great Raft was actually a series of smaller "rafts," or accumulations of log jams and driftwood, cemented with mud, sand, and debris, which blocked the flow of the Red River for up to 257 km (160 mi) from just above Natchitoches to almost the Arkansas boundary (Fenneman 1938:116-117, Figure 29; Humphreys 1984:76). One of the effects of the Great Raft on the Red River was the ponding of tributary valleys (Fenneman 1938:117). A number of such valleys were flooded, creating large lakes on either side of the Red River channel (Fenneman 1938:Figure 29). The current consensus of opinion is that Caddo Lake was formed in this manner, although its true age is still a matter of some debate (Albertson and Dunbar 1993; Hayner 1957a; Humphreys 1984:77; A.C. Veatch in Flores 1984:fn 1200).

The Red River Raft was not successfully removed until 1873, after the invention of nitroglycerine which was then used to blast it apart (Flores 1984:fn 135). Prior to that, Captain Henry Shreve had successfully forced a channel through the Raft between 1833 and 1838 (McCall 1984:196-232), but the Raft began to reform less than three months later (Humphreys 1984:87). It does not appear that any of these impermanent clearings of the Great Raft had much effect on tributary lakes, such as Caddo Lake. In fact, McCall notes that in order to dispose of the logs from the main channel of the Red River, Shreve had to "force the floating timber into the [branching] bayous and let them fill up" (McCall 1984:200). Thus, instead of draining the associated lakes and bayous, the initial clearance of the Red River Raft led to additional "damming" of peripheral channels with probably little effect on the associated lakes, such as Caddo Lake.

CULTURAL BACKGROUND

The LHAAP lies almost on the boundary between Texas and Louisiana within the overall Caddoan culture area (Wyckoff 1974). Although it properly lies within Northeast Texas, it can also be viewed as being

peripheral to northwestern Louisiana, with which it may actually be tied more closely during certain periods in prehistory. Recent summaries of archeological research pertinent to Northeast Texas and northwestern Louisiana include Jeter et al. (1989), Thurmond (1990), Story et al. (1990), and Kenmotsu and Perttula (1993). Specific summaries for the LHAAP itself include Gibson (1970:15-16), Dieste et al. (1985), Peter and Stiles-Hanson (1990), and Cliff and Peter (1992).

Previous Archeological Research

Archeological research in Harrison County began in 1920 when J.E. Pearce of the University of Texas included it in a reconnaissance of several Northeast Texas counties (Guy 1990). Pearce conducted tests at the Lane Mitchell Farm (41HS4), which consisted of a group of four low mounds southeast of Marshall (Thurmond 1990). He also surface collected an island in Caddo Lake and visited a mound site immediately upstream of Caddo Lake on Big Cypress Bayou (Thurmond 1990). A more extensive program of research in Northeast Texas from 1930 to 1934 included testing and excavation at three sites in Harrison County (41HS1, 41HS2, and 41HS3) by Burleigh Gardner and A.T. Jackson (Guy 1990:Table 3).

The specific area around Caddo Lake has been a focus of continuing research interest since Pearce's initial visit in 1920. In 1931, Winslow Walker of the Bureau of American Ethnology (BAE) visited the area and identified a site on the north shore of the lake as the historic village of the Petit Caddo (Walker 1932:169-171). Material collected from the Harrison Bayou site (41HS240), within the modern LHAAP, was used by James Ford in defining the Caddoan ceramic complex (Ford 1936); while Clarence Webb made use of surface collections from Harrison Bayou and Swanson's Landing (16CD8) in his definition of the Bossier focus (Webb 1948). In the 1950s, another avocationalist, E.W. Hayner of Karnack, Texas, began investigating prehistoric sites around Caddo Lake, where he had a cabin. As a result of these investigations, Hayner provided locations and descriptions for 21 sites around the lake and published articles regarding excavations at several Archaic and post-Archaic sites (Hayner 1955, 1957a, 1957b).

In the late 1950s and 1960s, research was undertaken in the region by both avocationalists and academic institutions. In 1962, personnel of the Texas Archeological Salvage Project (TASP) carried out limited salvage excavations at the Susie Slade site (41HS13), a protohistoric/historic Caddoan cemetery located along the Sabine River in the southwest portion of Harrison County (Guy 1990:77). Prior to the TASP work, uncontrolled digging at the site by local collectors was reported to have yielded approximately 50 burials, with numerous Late Caddoan vessels and European trade goods, such as glass beads and iron knives. Unfortunately, the limited TASP work at the site recovered only one burial, with five Late Caddoan vessels and a few glass and shell beads. Subsequent to the TASP work, additional controlled excavations by Buddy Jones of Longview yielded an additional three burials, with Late Caddoan vessels, glass and shell beads, and iron knives. The Slade site was later included by Jones in his definition of the historic Caddoan Kinsloe focus (B.C. Jones 1968). Local collectors apparently continued to dig at the Slade site, and may have excavated a minimum of 80 to 90 additional burials (Guy 1990:77). In the late 1960s, Clarence Webb and a group of avocationalists excavated at the Resch site (41HS16), an important multicomponent site in the Sabine basin (Webb et al. 1969). The Resch site yielded evidence of occupation during the Archaic, Early Ceramic, and Caddoan periods. Finally, Jon Gibson of Southern Methodist University (SMU) undertook a brief reconnaissance of Caddo Lake in 1968. Gibson revisited Harrison Bayou and Swanson's Landing as well as recording seven additional sites (Gibson 1970).

Research at Caddo Lake continued into the 1970s, with a limited survey conducted in the area by Gulf South Research Institute of Baton Rouge, and salvage excavations conducted at Mound Pond No. 1 in 1977. Gulf South's survey in the Caddo Lake area recorded 18 sites in Texas and 10 in Louisiana, including

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components of the Archaic, Early Ceramic, Caddoan, and Euro-american periods (Gulf South Research Institute 1975). Other work in the region in the 1970s and 1980s was undertaken by diverse Texas state agencies, including the Texas Water Quality Board (Guy 1990), the Texas Department of Water Resources (Guy 1990), the Texas Department of Transportation (Luke 1978; Thurmond 1990; Weir 1973; Wormser 1990), and the Texas Parks and Wildlife Department (Guy 1990). Beginning in the mid-1970s, and continuing into the 1980s, archeological research has also been carried out in connection with a number of lignite mining areas in the region. In Harrison County, intensive work has been conducted in relation to the South Hallsville facility in the southwest area of the county (Dibble 1977; Espey, Huston and Associates, Inc. 1979, 1984; Keller 1991; LaVadera 1982, 1983a, 1983b, 1984a, 1984b, 1985, 1987; North American Consultants, Inc. 1983a, 1983b, 1984, 1985; Price 1988). Less intensive work has been done for the Darco Mine, near South Hallsville (Carlson 1985; Corbin et al. 1976; Gadus et al. 1988; Pertulla and Skiles 1987; Studer 1982), and the Karnack Prospect north of Marshall (Heartfield, Price and Green 1986).

In regard to the LHAAP itself, as Peter and Stiles-Hanson (1990) note, archeological research within the plant has been extremely limited (Table 2). The early efforts of a local avocationalist, E.F. Nield of Shreveport, to locate prehistoric archeological sites and obtain surface collections included the recording of the Harrison Bayou site (41HS240) in 1935. A collection of 171 prehistoric sherds from this site was subsequently described by Ford (1936:96) in his initial formulation of a Caddo ceramic complex. Later, in 1948, Clarence Webb used a larger sample of 237 sherds from the Harrison Bayou site, along with collections from 14 other sites, as the basis for his definition of the Bossier focus (Webb 1948). Jon Gibson's reconnaissance along the margins of Caddo Lake in 1968 resulted in the recording of two sites within the LHAAP, 41HS240 (SMU number X41HS1) and 41HS241 (SMU number X41HS2). Gibson reportedly revisited the Harrison Bayou site (41HS240) and made an additional surface collection there. The other site within the LHAAP (41HS241) was newly recorded by Gibson (1970:29), but only two sherds and one burned rock were collected from it.

Late in 1983, W.J. Bennett (1984) conducted an intensive survey of 146 ha (360 acres) within the LHAAP, using systematic transect intervals of 20 to 25 m with associated shovel testing every 20 to 25 meters. The only cultural resources located as a result of this survey were the Hope No. 2 cemetery (41HS270) and the site of the former TNT production area and associated settling ponds. Subsequent to this, Heartfield, Price and Greene, Inc., prepared an archeological overview and management plan for the LHAAP as the initial step in the preparation of an Historic Preservation Plan (HPP) in compliance with Army Regulation 420-40 (Dieste et al. 1985). This work entailed no new fieldwork but did involve the preparation of an environmental and cultural background for the plant, as well as an assessment of known and potential cultural resources on the plant and recommendations for their treatment.

More recently, personnel of the Fort Worth District, U.S. Army Corps of Engineers (Roemer and Newman 1988), surveyed limited portions of the LHAAP which would be modified by actions associated with the Static Test Area and the Ground Signal Test Area. This work involved a total of 137 ha (339 acres), which was surveyed using systematic transects at 25-m intervals, and selective shovel testing in perceived high probability areas for site locations. This survey resulted in the recording of two historical sites which were dated to the early twentieth century (41HS395 and 41HS396). No prehistoric sites were located. Finally, in 1988 and 1989, GMI of Plano, Texas, conducted an assessment of the potential for significant cultural resources within the LHAAP (Peter and Stiles-Hanson 1990). This work included (1) an evaluation of landform types and the historic and modern impacts associated with them, (2) archival research to trace land ownership patterns and to identify military and premilitary sites of potential significance, and (3) reconnaissance survey efforts to evaluate the potential for archeological resources within the plant (Peter and Stiles-Hanson 1990:ix). As a result of this assessment, 39 localities were identified within the plant

Table 2
Summary of Cultural Resource Investigations to Date in the Area of the Longhorn Army Ammunition Plant

Project Type	Date	Contractor or Researcher	Reference	Summary of Work
Site Survey	1930s	E.F. Nield	-	Harrison Bayou site (41HS240) recorded; surface collection made.
Analytical Synthesis	-	James A. Ford	Ford 1936	Collection of 171 sherds from the Harrison Bayou site described by Ford in his initial formulation of a Caddoan ceramic complex.
Analytical Synthesis	-	Clarence H. Webb	Webb 1948	Collection of 237 sherds from the Harrison Bayou site, along with collections from 14 other sites, used by Webb as the basis for his definition of the Bossier focus.
Survey	1950s	E.W. Hayner	TARL Files	Avocational survey of areas around Caddo Lake resulted in the recording of Archaic site 41HS385 on the LHAAP.
Reconnaissance	1968	Southern Methodist University	Gibson 1970	Reconnaissance along the margins of Caddo Lake resulted in the recording of two prehistoric sites within the LHAAP - the Harrison Bayou site (41HS240) and site 41HS241.
Survey	1983	W.J. Bennett	Bennett 1984	Survey of approximately 145 ha (360 acres); recording of the Hope No. 2 Cemetery (41HS270).
Cultural Resource Planning Survey	1984	Heartfield, Price, and Greene, Inc. Fort Worth District, U.S. Army Corps of Engineers	Dieste et al. 1985 Roemer and Newman 1988	Development of overview and management plan for the LHAAP. Survey of approximately 137 ha (339 acres) of the LHAAP to be impacted by the Static Test Area and Ground Test Area; recording of two historic sites (41HS395 and 41HS396).
Cultural Resource Planning	1988-1989	Geo-Marine, Inc.	Peter and Stiles-Hanson 1990	Assessment of the potential for significant cultural resources within the LHAAP; 39 localities identified which could potentially contain significant cultural resources.
Survey	1989-1992	Geo-Marine, Inc.	Cliff and Peter 1992	Survey of approximately 785 ha (1,940 acres) conducted over a period of three years resulted in the recording of seven prehistoric sites, 16 historic sites (including the Hayner Cemetery), and four multicomponent sites.

which could potentially contain significant cultural resources (Peter and Stiles-Hanson 1990:23-37). In addition, a third prehistoric site (41HS385) was identified on the basis of Texas Archeological Research Laboratory (TARL) records, although not revisited. Subsequently, between 1989 and 1991, GMI surveyed 785 ha (1,940 acres) of the LHAAP in three phases (Cliff and Peter 1992). As a result of this work, four prehistoric, 16 historic, and four multicomponent sites were recorded, of which two were recommended to be eligible for the NRHP and four were recommended to be of unknown eligibility (Cliff and Peter 1992).

Native American Culture History

The cultural-historical sequence presented here for the LHAAP represents a brief summary overview. This summary does not attempt to resolve differences in chronology and terminology; rather, Native American culture history is presented in broad temporal periods. The chronological scheme used is adapted from Story (1990), Thurmond (1990), and Kenmotsu and Perttula (1993) and consists of five broad temporal periods: Paleo-Indian, Archaic, Early Ceramic, Caddoan, and Historic (Table 3).

Table 3
Native American Cultural Sequence for Northeast Texas

Temporal Period	Date
Paleo-Indian	9,500 - 7,000 B.C.
Archaic	7,000 - 200 B.C.
Early Ceramic	200 B.C. - A.D. 800
Formative Caddoan	A.D. 800 - 1000
Early Caddoan	A.D. 1000 - 1200
Middle Caddoan	A.D. 1200 - 1400
Late Caddoan	A.D. 1400 - 1680
Historic Caddoan	A.D. 1680 - 1860

Paleo-Indian Period

The earliest evidence for aboriginal occupation in Northeast Texas can be dated to the Paleo-Indian period (ca. 9,500-7,000 B.C.). Unfortunately, the reconstruction of Paleo-Indian adaptations within Northeast Texas is hindered by a lack of information from sites with good contextual integrity. Nevertheless, occupation of Northeast Texas during the Paleo-Indian period can be recognized on the basis of the numerous surface finds of diagnostic projectile points recovered there (Carley n.d.) and in surrounding areas (Gadus and Howard 1988:21; Schambach and Early 1982). Such diagnostic point forms include Clovis, Plainview, Dalton, Scottsbluff, and San Patrice types. Despite the preponderance of surface remains, buried sites of the Paleo-Indian period do undoubtedly exist within the deep floodplain and terrace deposits along East Texas rivers. At the present time, no dated Paleo-Indian sites in good contexts are known within Northeast Texas, and the temporal span of this period (ca. 9,500-7,000 B.C.) must be inferred from dated sites to the west. Although the data base is extremely limited, Shafer's (1977) suggestion that the Paleo-Indians of the woodland regions were supported by a diversified economic base is generally accepted at the present time.

Archaic Period

A number of researchers have noted that, like the preceding period, our knowledge of the Archaic (ca. 7,000-200 B.C.) is hampered by a lack of data from stratified or single component sites (Pertulla 1988; Story 1985). While undoubtedly more numerous than Paleo-Indian sites, Archaic components have yielded little additional information concerning settlement-subsistence strategies. Indeed, the majority of the sites of this period known in Northeast Texas are merely surface finds or are multicomponent sites with severely mixed assemblages (Campbell et al. 1983; Story 1981). Consequently, only generalized temporal trends in artifact types, mostly projectile points, have been proposed (Johnson 1962).

The first part of the Archaic period, known as the Early Archaic (ca. 7,000-4,000 B.C.), is presently believed to be characterized by a pattern of small and widely distributed occupation sites, which may reflect a high group mobility within large and poorly defined territories (Story 1985:35, 39). These small groups are hypothesized to have practiced a generalized subsistence economy, and the perceived occurrence of

stylistic similarities in projectile point forms from the Ozark Highlands to the Edwards Plateau has been taken as indicative of quite extensive interregional contacts.

Although assemblage data for the next part of the Archaic, known as the Middle Archaic (ca. 4,000-2,000 B.C.), are less limited, chronology and subsistence patterns are still poorly known. For the Middle Archaic in general, several trends appear to be apparent, including: (1) an increased diversity of tool types; (2) greater interregional variability; (3) addition of ground, pecked, and polished stone tools; and (4) an increased use of plant foods as indicated by the addition of mortars, pestles, and mealing stones (Gadus and Howard 1988:23). Diagnostic Middle Archaic dart points for East Texas may include Big Sandy, Calf Creek, Johnson, Morrill, and Carrollton (Story 1990:Figure 32).

During the final portion of the Archaic period, known as the Late Archaic (2,000-200 B.C.), an apparent increase in the number of sites, a more expansive distribution of sites over the landscape, and evidence of some degree of sedentism in the sites have been taken to reflect increasing population size, limited group mobility, and the probable formalization of interregional contact. In addition, it has been suggested that the wide geographic dispersal of sites also may reflect the intensification of a diffuse economic system which was dependent upon the use of all available floral and faunal resources. Diagnostic Late Archaic dart points for East Texas may include Inge, Castroville, Ellis, Palmillas, Edgewood, and Yarbrough (Story 1990:Figure 32).

Early Ceramic Period

The period of time between about 200 B.C. and A.D. 800, collectively referred to here as the Early Ceramic period, appears to have been one of great variation and change in regard to both local cultural patterns and exterior influence throughout all of East Texas and the surrounding areas. The Early Ceramic period appears to mark the introduction of pottery, mound building, burial ceremonialism, and horticulture into the area of Northeast Texas (Peter and Stiles-Hanson 1990). Much of the early ceramics in this region are characterized by plain, grit-and-grog tempered wares (usually referred to as Williams Plain, a type considered to be diagnostic of Fourche Maline culture in both Arkansas and Oklahoma) and plain, bone-tempered wares (Schambach 1982:160-172; Webb 1982:258-261). From south of the Sabine River to the Gulf Coast, a sandy paste ceramic ware (cf. Bear Creek Plain) appears to be more common (Story 1981:146). Influences from various Lower Mississippi Valley cultures or traditions (viz., Tchefuncte, Marksville, and Coles Creek) apparently were felt in Northeast Texas throughout this period (Story 1990). Most noticeably, this influence appears in the form of ceramics which were either manufactured elsewhere or which were manufactured locally but whose form and decoration were influenced by stimuli from elsewhere.

Caddoan Period

The final prehistoric manifestation in Northeast Texas was that of the Caddoan period, which includes a number of prehistoric phases or foci believed to be ancestral to the Caddoan-speaking groups which occupied the area at the period of initial European contact. In every sense, the Caddoan period marks the final prehistoric florescence of the area. Caddoan culture was characterized by a horticultural economy based on maize; various types of ranked or stratified sociopolitical systems; extensive interaction and trade, both with groups to the east and with groups to the west; and a highly developed and distinct ceramic tradition.

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The Caddoan period has been subdivided into a formative, early, middle, and late phase, with Formative Caddo dating from ca. A.D. 800 to 1000, Early Caddo from ca. A.D. 1000 to 1200, Middle Caddo from ca. A.D. 1200 to 1400, and Late Caddo from ca. A.D. 1400 to 1680 (Kenmotsu and Perttula 1993). The Formative and Early Caddoan periods show strong ties to the earlier Coles Creek culture but also show a number of new characteristics, including new projectile points (i.e., Colbert, Hayes, Washita, and Homan arrow points), new ceramic vessel forms (i.e., the carinated bowl and the bottle), and also new modes of vessel decoration (i.e., fine engraving with red pigment filler). Mound centers continue from the earlier Coles Creek period, but are larger, with nonmound sites widely distributed along tributary lakes and streams (Gadus and Howard 1988:29-30).

The Middle Caddoan period in this area consists of the Haley phase (ca. A.D. 1200-1400). This phase was centered in the Great Bend region in Arkansas, but the LHAAP area did fall within its peripheral influence, as demonstrated by a major Haley component at the Belcher site in Caddo Parish, Louisiana (Webb 1959). In this area, the Haley phase appears to represent an elaboration of earlier Alto ceremonialism, with the retention of much of the earlier period's settlement and subsistence orientation (Gadus and Howard 1988:30).

The Late Caddoan period includes the Bossier (ca. A.D. 1400-1500) and Belcher (ca. A.D. 1500-1700) phases, both centered in the Great Bend region of Arkansas and Louisiana but including the LHAAP area. The early part of the Late Caddoan period in the LHAAP area (i.e., the Bossier phase) appears to be characterized by the founding of a number of small village or hamlet sites in the uplands around the Red River valley and the presence of large ceremonial mound centers located in the alluvial floodplains of major rivers and streams (Dieste et al. 1985:2-20; Gadus and Howard 1988:31). The subsequent Belcher phase, although historic in date, largely predates the period of sustained European contact which began after 1680. Displaying a high degree of ceremonialism and fine ceramic wares even in the later stages, this protohistoric phase apparently ended with a change to a more dispersed settlement pattern. The Caddo moved from riverine mound complexes with their associated villages, to inhabit almost exclusively the small upland hamlets previously discussed. It has been suggested that a series of drought-related crop failures contributed to this shift, affecting socioreligious and political institutions as well as settlement patterns (Dieste et al. 1985:2-20; Gregory 1974:236).

Historic Period

After 1680, the Native American cultures in this region were increasingly modified through contact with Europeans. Early explorers passing through or near this region included de Soto in 1541 (Hackney 1966:3), Joutel and Douay in 1685 (Hackett 1931:172-174), and Terán de los Rios (Dieste et al. 1985:222). Several historic tribal divisions within the Caddoan linguistic family can be recognized archeologically as having their beginnings during the Late Caddoan period. The most relevant to the LHAAP complex is the Kadohadacho confederacy, comprised of the Kadohadacho (Caddo Proper or Real Caddo), the Petit Caddo, the Nasoni, the Nanatsoho, and the Upper Natchitoches (Fletcher 1907:179). The area around Caddo Lake, inclusive of the LHAAP, was most likely inhabited and traversed primarily by these people. Although only slightly beyond the northern reaches of the Hasinai confederacy, also Caddoan-speakers, it is unlikely that any members of that confederacy settled in the Caddo Lake region.

Euro-American and African-American Historical Background

The non-Native American exploration and settlement of the Caddo Lake area can be divided into three broad temporal periods. During the first period, from ca. 1541 to 1835, the European presence in the

Caddo Lake area was largely secondary to that of the Native Americans, who were still the area's primary occupants. European expeditions passed through the area, and limited numbers of Europeans were resident in the area, largely in order to trade with the Native American residents. Subsequently, between ca. 1835 and 1865, the area around Caddo Lake was increasingly settled by Anglo-American Texans, with an economy built on slave-based agricultural production. Finally, with the end of the slave-based economy in 1865, the area entered its final period, with the economy based on wage-labor production, first in the agricultural area, and then later in the areas of timber and oil production.

Initial Contact Period

According to Hackney (1966:3), the remnants of Hernando de Soto's 1541 entrada passed a large lake system in East Texas, which he identified as the Caddo Lake system. Later, Tonti described crossing the narrows of a similar lake system to reach the Kadohadacho, and Joutel documented crossing the narrows of a large lake in this region as well (Hackney 1966:3). Don Domingo Terán de los Rios and his entrada also may have crossed the area of the LHAAP (Dieste et al. 1985:2-22) on their way to the Kadohadacho village located on the Red River near present-day Texarkana (Swanton 1946:57). According to local history, there was a brief Spanish occupation of the hill now located within the confines of Caddo Lake State Park to the west of the LHAAP. If true, however, this was probably a transitory occupation, at most. Although an attempt was made by the Spanish to establish missions among the Kadohadacho (Hackett 1931:283), no prolonged European contact was maintained until the arrival of the French. In 1719, Bénard de La Harpe established a trading post at the Nassonite village above the Great Bend in order to initiate French trade in the Kadohadacho territory (Cain and Koenig 1971:110). The French maintained close ties to the Kadohadacho until the cession of Louisiana to Spain in 1762.

During the period of Spanish control of Louisiana, many tribes with ancestral homelands located east of the Mississippi River began to move west into Louisiana and Texas to escape the influx of Anglo-Americans. The Choctaw easily invaded the Caddoan lands, resulting in a domino effect upon indigenous tribes (Kinnaird and Kinnaird 1980:350-351). As the English, and later the Americans, pushed the Choctaw west of the Mississippi, they sent smaller tribes fleeing before them, pushing Louisiana and Texas tribes further west (Kinnaird and Kinnaird 1980:364-365).

Toward the end of the eighteenth century, the Kadohadacho abandoned their villages along the Great Bend in an attempt to escape their enemies, the Osage, and moved south to inhabit the area around Caddo Lake (Glover 1935:897). Several Caddoan-speaking bands had moved together by this time, with the Kadohadacho absorbing smaller groups (Webb and Gregory 1986:23). They would maintain this position until the Americans purchased Louisiana from France in 1803. Then, under intense pressure from white settlers and the United States government to cede their lands, the Caddo signed a treaty in 1835 selling approximately one million acres of land to the United States. Although many of the Caddo left the region, a number did stay near Shreveport and around Caddo Lake (Webb and Gregory 1986:24-25).

Early American/Texan Period

After the Louisiana Purchase, the Caddo Lake area and all of present-day Harrison County, was included in the disputed "Neutral Strip," resulting from the uncertainty of the boundary between Texas and Louisiana. This boundary dispute was supposedly settled in 1819 with the signing of the Adams-Onís Treaty between the United States and Spain.

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The first major area of Texan settlement within the bounds of present-day Harrison County centered around Caddo Lake, especially at the later site of Port Caddo. As a result of its long history of being central to Indian trading activities, this region had a well defined trail, the Comanche Road, to the west, and Trammell's Trace running from Nacogdoches to the mouth of Cadron Creek near present-day Conway, Arkansas (Webb et al. 1952:2:793).

Subsequent to Mexican Independence, attempts at settlement in East Texas involved colonizing efforts under empresario contracts issued by the Mexican Government. One such contract was issued to General Arthur Wavell in 1826 to colonize a large area north of the Sabine River that included all of present-day Harrison County. The U.S. government protested, however, that this area was part of the United States as designated in the Adams-Onís Treaty of 1819, and General Wavell's contract was canceled by the Mexican authorities in 1830. As a result of this, Texan settlement of this area was postponed (Hackney 1966:5; Webb et al. 1952:2:871).

In the years immediately prior to Texas Independence in 1836, some Texan settlements did become established in the area. In 1835, 22 special land patents were issued by the Mexican Land Commissioner, most averaging around 1,619 ha (4,000 acres). These patents were in the newly-formed Tenehaw municipality, of which present-day Harrison County was a part (Hackney 1966:6-7). Because of the boundary dispute with the United States, however, no titles were issued on these patents until after the Texans achieved their independence from Mexico on March 2, 1836 (Dieste et al. 1985:2-26).

In general terms, the majority of the land grantees in the area of present-day Harrison County can be classified culturally as Anglo-Americans. These grantees received their lands at various periods from the Mexican Government, the Republic of Texas, and the State of Texas. These grants range in size from 48 to 1,084 ha (119 - 2,678 acres; Peter and Stiles-Hanson 1990:Table 1, Figure 3) and often were awarded for various specific reasons, such as rewards to veterans of the Mexican-American War or from accepting applications for public lands (Dieste et al. 1985:2-24, 2-29; Hackney 1966:5-8; General Land Office n.d.; Harrison County Historical Museum n.d.; Hope Family File 1865-1870, n.d.; Starr Family File n.d.).

The first permanent settlers in Harrison County were generally cotton planters from the South (Webb et al. 1952:1:780). The region's cotton growers were linked to the Port of New Orleans, via Caddo Lake and the Red River, down which thousands of bales were shipped annually by steamboat from Swanson's Landing, Port Caddo, and the city of Jefferson (Eaton 1975:211-214; Hackney 1966:24-28; Harrison County *Probate Records* 1865-1870). In 1836, the settlement of Port Caddo on Big Cypress Bayou was logged as a "landing" by the captain of the steamboat, *Nicholas Biddle*, indicating that Port Caddo had become a town (Hackney 1966:7-8). With the establishment of the Republic of Texas in 1836, Port Caddo became the port of entry for the new Republic in the northeast. It was through Port Caddo that goods were shipped via Caddo Lake to the Red River, then down the Mississippi to New Orleans (Webb et al. 1952:1:266).

After 1836, the Congress of the Republic of Texas gave land to settlers who moved to Texas with their families and established a homestead for three years. Each settler was issued a certificate after fulfilling the conditions required for settlement, the land was then surveyed out of public domain, and a patent was issued through the General Land Office and the President of the Republic (later the governor in Austin). In all, 21 land patents were issued for the area of the LHAAP within present-day Harrison County between 1842 and 1911 (Peter and Stiles-Hanson 1990:Table 1). At least two of the original 21 grants were awarded by the Texas Republic for service at the Battle of San Jacinto (Miller 1967:415, 449), specifically those of George W. Lewis (Abstract 426) and John B. McDaniel (Abstract 494).

In 1839, Harrison County was created as a result of the division of Shelby County, and Port Caddo became the hub of Harrison County. As well as being connected to the Comanche Trail and Trammell's Trace, Port Caddo was now located along the Shreveport Road and the road to Marshall, as well as connected by water to Jefferson, Shreveport, and ultimately, to New Orleans. Supplies and manufactured goods made their way into Texas, and agricultural products, especially cotton, were shipped out daily. Port Caddo was a designated mail terminus in 1839, and the site of a customs house to regulate imports and exports, although it was a duty-free port for some time (Hackney 1966:25-26).

Port Caddo continued a steady growth after the United States' annexation of Texas in 1845. New communities developed, and stagecoaches traveled roads from Port Caddo to Arkansas, Louisiana, and the Texas interior (Hackney 1966:29). In the late 1840s, Jefferson began to gain ascendancy over Port Caddo as a shipping station, Marshall began to grow, and by the late 1850s, Port Caddo was no more than a plantation village with a cotton economy (Hackney 1966:30).

Settlement of Harrison County after Texas' annexation by the United States was primarily by Americans from the southern cotton-producing states. These settlers came in quest of lands with productive soil, which they found in Harrison County. In the 1850s, the county was "overwhelmingly rural," and most inhabitants lived on small farms or plantations (Campbell 1983:20-21). In 1850, nearly three of every four families depended on farming for a living, and the majority of households owned at least one slave. Two-thirds of all households owned property (Campbell 1983:25-33).

Following Lincoln's election as president, Harrison County voted to secede from the Union in 1861. Men and supplies were committed to the Confederate army, and Port Caddo became strategic once again, enjoying a brief resurgence as a Confederate shipping port. Harrison County suffered from a lack of supplies such as coffee, paper, and manufactured items, but food was plentiful and cotton exports continued. Neither invaded nor occupied by Union forces during the war, Harrison County's basic economic, social, and political structure remained basically unchanged throughout the Civil War (Campbell 1983:183, 208, 245). A Confederate powder mill was located outside of Marshall, and a Confederate bullet factory was purportedly located just beyond the northern boundary of the LHAAP (Dieste et al. 1985:4-1).

Post-Civil War Period

For several years following the end of the Civil War, cotton remained an important commodity in Harrison County, although the emancipation of the black slaves required a shift in the economic base of cotton production. Immediately following the war, freedmen were contracted by former slave owners to work their land. Subsequently, the development of the sharecropping system replaced wage labor and was probably the most important economic development during the Reconstruction period. Although presenting a step forward for the blacks of Harrison County, "sharecropping did not affect patterns of land ownership, and it had the potential to lock blacks into patterns of debt to planters and merchants that would be extremely limiting in the future" (Campbell 1983:294). Sharecropping was still common in the 1930s, and most African-American sites within the confines of the LHAAP were probably associated with sharecroppers and tenant farmers (Doris Powell 1988:personal communication).

The rise of sharecropping marked the end of plantation-style agriculture in Harrison County. Without slaves or wage labor under their control, planters found it was economically unfeasible to cultivate cotton on the scale of the 1850s. Plantations were broken into smaller farms, although this did not necessarily indicate a change in land ownership, or in the socioeconomic status of the former planter class (Campbell

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1983:295). This decline in cotton production, coupled with the clearance of the Red River log jam and the accompanying drop of water level in Caddo Lake, led to the end of river traffic through the Caddo Lake ports after 1873 (Sutton and Conrad 1985:26).

The timber industry and oil/gas exploration were relatively late economic avenues for the people in and around the LHAAP area. Although thought of as a predominantly pine forest area, the uplands and slopes adjacent to the lakes and streams contained cypress, hickory, walnut, ash, and oak, among other trees. Timber was shipped by rail on one of the several railroads servicing the area. The sawmills were strung along the various railroad lines, gaining ready access to consumer markets for their finished products (*Morning Star* 1894:1-9). The town of Karnack, adjacent to the present-day LHAAP, was established in 1900 along the route of the Louisiana and Arkansas Railroad (Key 1964:37). The town was reportedly named Karnack because it was the same distance from Port Caddo that Karnack in Egypt was from Thebes (Webb et al. 1952:1:938).

The first oil field on Caddo Lake was discovered just after the turn of the century near Oil City, Louisiana. Gulf Oil Company leased most of the lake bed before drilling production wells. Wildcat exploration accompanied drilling by major oil firms. Most notable in the Karnack area was T.J. Taylor who completed at least six wildcat wells before 1917. Leasing large blocks of land and later selling percentages of the well production was identified as one method of raising capital to finance this type of exploration. Lease prices ranged from 25 to 50 cents per acre in the early years and rose to as much as 5 dollars per acre on leases located on Pine Island (Sutton and Conrad 1985:83-85; Doris Powell 1988:personal communication).

Even with the development of the timber and oil industries, it appears that land use and settlement patterns did not change drastically in the years between the end of the Civil War and the beginning of World War II. Farming continued to be the primary occupation, with land ownership still basically in the hands of a white "landlord class." Blacks within this area appear to have been primarily sharecroppers or tenant farmers throughout the period with no known major black settlements or communities.

In December 1941, approximately 3,597 ha (8,889 acres) were acquired by the federal government for the purpose of constructing a munitions plant, to be designated Longhorn Ordnance Works. Subsequently, in 1947, about 160 ha (396.31 acres) located north of the present boundary of the plant were exscessed from the facility (Dieste et al. 1985:1-5). Following acquisition of the land, a TNT facility, designated Plant 1, was constructed and operated throughout the war under contract with the Monsanto Chemical Corporation. In November of 1944, planning began for the construction of a new three-line JB-2 propellant fuel facility, to be designated Plant 2, but this construction was halted in 1945. After the end of World War II, the plant went on inactive status, but was rehabilitated in 1951, when Plant 2 was converted to a Korean War pyrotechnic facility (Dieste et al. 1985:1-5). In 1953, a third facility, designated Plant 3, was constructed for the production of solid propellant rocket motor units. In 1956, Plant 2 was shut down but production of rocket motors continued at Plant 3 into the 1980s. In 1964, a part of Plant 2 was again reactivated and expanded for the production of pyrotechnic type ammunition for the war in Southeast Asia (Dieste et al. 1985:1-5). Then in the 1990s, the plant became notable as the site for the destruction of Pershing Missiles in accord with the START agreements, and more recently the entire facility has again been deactivated.

CHAPTER 3

RESEARCH OBJECTIVES AND METHODOLOGY

The investigations reported on here were undertaken in order to identify any prehistoric or historic archeological sites contained within five timber management units totaling 333 ha (823 acres) at the Longhorn Army Ammunition Plant (LHAAP) in Harrison County, Texas (Figure 2). This work was undertaken in order to ensure that no significant cultural resource sites would be adversely affected by future timber-cutting activities in unsurveyed areas within the LHAAP. The work was conducted with three primary goals in mind:

- (1) to locate cultural resources occurring within the designated timber management units;
- (2) to assess the significance of those resources in regard to their potential for inclusion in the National Register of Historic Places (NRHP); and,
- (3) to make recommendations for the treatment of those resources based on their NRHP assessments.

The first of these goals was accomplished by a program of systematic pedestrian survey and shovel testing undertaken using the field methodology described in the second part of this chapter. This survey located and recorded or rerecorded four cultural resource sites and five nonsite localities. The assessments of significance and recommendations for these four sites are presented in a preliminary fashion in the next chapter on research results, and are reiterated in the final chapter.

The remaining portions of the present chapter present the methodological background for the investigations, the explicit survey methodology used in the field, and a discussion of the artifact analysis phase of the research.

INTENSIVE SURVEY METHODOLOGY

The systematic pedestrian survey of the 333 ha of woodland at the LHAAP (see Figure 2) was carried out between October 18 and October 28, 1993. The effort involved a crew of four people (three crew members and one Field Supervisor) under the supervision of the Project Archeologist (Dr. Maynard Cliff) and the Principal Investigator (Mr. Duane Peter). Mr. Floyd Kent served as Field Supervisor for the project. In all, the pedestrian survey of the 333 ha of the LHAAP involved a total of about 30 person-days in the field, for an average daily work figure of about 11.1 ha (27.4 acres) surveyed per person-day. During this survey, one prehistoric and three historic archeological sites were located and recorded or rerecorded, for an average density of about one site per 83 ha (206 acres).

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The 1993 survey area consisted of five management units (MUs) of the LHAAP. MU 29 in the southwestern portion of the plant consists of about 117 ha (290 acres). The consecutive MU 16 (57 ha or 140 acres) and MU 17 (48 ha or 118 acres) are located in the central portion of the plant. MU 8, totaling 95 ha (235 acres), is located in the north-central portion of the plant. MU 36 covers only 16 ha (40 acres) in the southeastern portion of the plant, east of Harrison Bayou (see Figure 2). About half of MU 16 is occupied by a Hazardous Waste Dump and was left unsurveyed.

While on survey, the crew traversed the landscape at intervals which varied from 20 to 30 m, with the wider interval used in flat upland areas at some distance from water in consideration of the decreased likelihood for the presence of prehistoric sites in such areas. Since the ground cover hindered site detection in virtually all areas, discretionary shovel testing was conducted along each transect, in areas of perceived likelihood for buried cultural resources -- that is, in any landform and/or surface feature that suggested a possibility of containing cultural material or in areas which were judged to have a high probability of site location, such as level terrace areas adjacent to floodplains or streams, knolls or benches above water sources, and flat upland edges close to water. Special attention was paid to those areas which previous archival research had indicated might be the former location of historic homesites (Peter and Stiles-Hanson 1990). Each shovel test measured approximately 30 cm across, and was excavated in 20 cm levels to test for subsurface deposits. The fill from each test was screened through 6.35 mm ($\frac{1}{4}$ in) hardware cloth to recover any artifactual material that might be present. Each shovel test was continued until two sterile levels, or subsoil (i.e., the Bt horizon), was reached, and was backfilled after excavation. Approximately 796 shovel tests were excavated on survey in an effort to locate archeological sites, for an average of 2.4 shovel tests per ha (or a little less than one shovel test per acre).

In the process of testing a landform or surface feature, if the initial shovel test proved to be positive (that is, if it was found to contain cultural material), a series of additional shovel tests (generally ranging from five to 12 in number) were excavated to determine if the area should be designated a site. For purposes of this survey, site designations were applied only to clusters of artifacts (whether surface or subsurface) which give the appearance of being preserved occupation or activity areas. Generally, a site was defined as having either: (1) a surface artifact scatter (i.e., more than one artifact) and one positive shovel test, or (2) no surface remains but at least two positive shovel tests. This definition ensured that each site would have both a horizontal and a vertical dimension, in contrast to individual shovel tests which, like isolated surface artifacts, have no horizontal dimension. Other areas which consisted of isolated finds, recent trash dumps, or which showed no evidence of preserved archeological deposits were designated as "localities." All unequivocal evidence of post-1945 activities were similarly classified. Such localities were recorded in the field as to specific location and field interpretations.

Once a site was identified, either on the basis of shovel testing or through the discovery of surface materials, the site limits were estimated on the basis of additional shovel testing. A minimum of eight shovel tests was excavated in and around the site area in an effort to define the horizontal and vertical extent of the site, the nature of the subsurface deposits, and the degree of disturbance (the exception to this is site 41HS420, where undisturbed areas were hard to find). As with the survey shovel tests, these were generally 30 cm across, excavated in 20-cm arbitrary levels, and the matrix was screened through 6.35 mm hardware cloth. All site-associated shovel tests were excavated to the base of the culture-bearing deposits and all were placed so as to allow their location on a site map. All artifactual materials recovered both from survey and site-associated shovel tests were collected.

Each shovel test was given a number designation and a standardized form was filled out following the test's completion. These shovel test forms listed each level of the test, the depth of the level, the soil matrix that defined the level (including Munsell color), and the artifactual material that was recovered from each level. The limited soil profiles exposed in these shovel tests was usually sufficient to indicate the overall depth

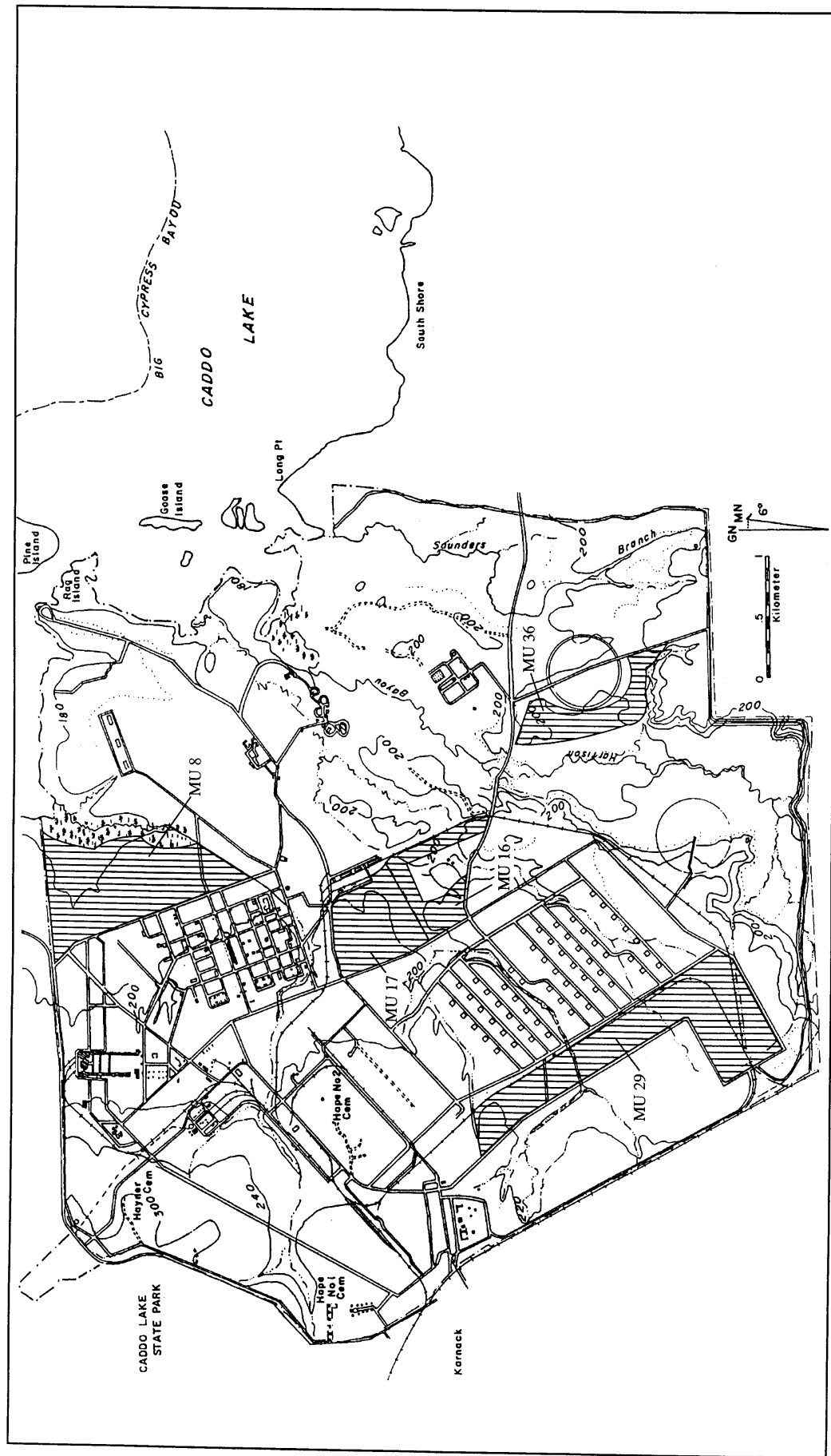


Figure 2. Map of Longhorn Army Ammunition Plant delineating timber management units surveyed in 1993.

to the clay-enriched subsoil (i.e., the Bt horizon). However, the surface horizon of organic accumulation (i.e., the A horizon) and the lower alluvial horizon characterized by loss of clay and other minerals (i.e., the E horizon) could not always be distinguished from each other in the small exposures within the shovel tests (for discussions of soil horizons, see Buol et al. 1973 and U.S. Department of Agriculture, Soil Conservation Service 1962). For this reason, the term "combined AE horizon" is sometimes used in the site descriptions to distinguish the upper portion of the solum as a whole from the subsoil. When sterile shovel tests were defined in all four directions, the site boundaries were considered to have been approximated and shovel testing ceased.

A State of Texas site recording form was filled out while on the site, noting location, vegetational cover, contextual integrity, approximate temporal period if possible, and artifactual material (both surface and subsurface); and the location of the site was noted on the appropriate U.S.G.S. topographic map. A scaled pace-and-compass map was drawn of each site, showing the locations of all significant features, areas of disturbance, vegetation, surface artifacts, and testing units. Each site was photographed from at least two different viewpoints, using both black-and-white prints and color transparencies, including in the image any damage evident to the cultural resources by vandalism, construction, or earth disturbances of any kind. Surface features and uncollected surface artifacts were also photographed. These photographs were recorded in a photo log.

In addition to the shovel testing and other site recording procedures mentioned above, limited surface collections of temporally diagnostic artifacts or tools were made on both prehistoric and historic sites with surface artifact scatters. On historic sites with surface materials, collections were made of decorated ceramics, decorated and embossed glass, and pieces with maker's marks or indications of manufacturing technology.

For any sites which contained either surface features or features discovered in shovel tests, recording procedures included the additional description of these features on the shovel test form and in the supervisor's notes, and photographs in addition to the normal photographs taken on the site. Each recorded site was identified with a permanent marker, consisting of a metal rebar stake, placed on the site. The location of each marker was indicated on the site map. The top of this marker was in turn covered with an aluminum cap bearing the site's identifying State of Texas number in the form of "41HSxxx". This number is a permanent state site number given by the primary state curatorial facility, the Texas Archeological Research Laboratory (TARL) of the University of Texas at Austin, and consists of a numerical state identification ("41" for Texas), a two-letter county identification code ("HS" for Harrison County), and a specific site number unique to that site within the county. Field notes concerning survey procedures for each transect, shovel testing observations, localities, and sites were maintained by the Field Supervisor. These field notes documented survey conditions, vegetation cover, amount of area covered daily, and initial interpretations of the cultural properties.

ARTIFACT TREATMENT AND ANALYSIS

All cultural material collected during the present phase of survey at the LHAAP were bagged by site or locality number, shovel test number, and excavation level. The bags were collected at the end of each day while in the field, and each was assigned an arbitrary number that was recorded on a master log sheet, along with the project number, the site or locality number, the shovel test number, the level number, the depth of the level below surface, the contents of the bag, the excavator's initials/name, and the date. This system provided a means of tracking the bags once out of the field, locating lost bags, and identifying mislabeled bags. All of this material was returned to the laboratory facilities of GMI in Plano, Texas,

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where all artifacts were washed, catalogued, and labelled in compliance with TARK standards. Prehistoric and historic artifact analysis was undertaken at GMI's facilities by GMI personnel.

A total of 53 artifacts was recovered from the four cultural resource properties and from three of the nonsite localities reported on here. Fourteen of these were prehistoric artifacts, recovered from one site and two localities; while the remaining 39 artifacts were historic and were recovered from the three sites with historic components and from two of the localities. The results of the analysis of this collection are presented along with the descriptions for each site in the following two chapters.

The primary goal of the artifact analysis was to assign the sites to a particular temporal period and to provide some initial indication of site function, although for prehistoric sites such an estimation of function must be considered only preliminary. From the beginning, it was suspected that most of the historic sites located would fit into the broad late nineteenth to early twentieth century period, but it was felt that the artifact analysis, in combination with whatever archival data was available, might allow a more accurate determination of the date of occupation to be made.

Prehistoric Artifact Analysis

The analysis of the small sample of prehistoric artifacts collected within the LHAAP by this project was designed to provide some estimate of period of site occupation, if possible, and to characterize the range of artifacts present on each site, with the assumption that the range of artifacts present is a reflection of the range of activities that occurred on the site. Finally, in order to provide comparability with previously collected data from similar prehistoric sites in the region, the analysis makes use of artifact categories used previously in Northeast Texas (see Appendix A). A total of 14 prehistoric artifacts was collected from site 41HS240 and Localities 2 and 5 within the 333-ha survey area at the LHAAP (see Appendix B). During the analysis of this material, each artifact was examined in sufficient detail to allow the identification of specific attributes and its placement into a specific artifact class.

The major artifact classes identified by this analysis included finished bifacial tools, unfinished bifaces, unifaces, unmodified lithic debris, utilized debitage, cores, ground stone, and prehistoric ceramics. In addition, nonartifactual cultural remains such as unworked cobbles, fired clay, and burned rock were also separated out and analyzed, when present. Unfinished bifaces were placed into subclasses specified as "early aborted," "late aborted," "preforms," or "unidentified fragments." Detailed definitions for all categories of lithics used in the present analysis are presented in Appendix A. The variables recorded for the prehistoric ceramics included the type of sherd (i.e., rim or body), sherd size (especially thickness) and weight, size and type of aplastic inclusions (i.e., temper), and exterior surface treatment and decoration (if any present). Whenever possible, a tentative identification as to type was made.

Historical Artifact Analysis

The goals of the historical artifact analysis were primarily to provide data on the periods during which the site was occupied, and secondarily to generate data which would allow an initial estimation of site function. In regard to this second goal, it has been found in the past that a reliable estimate of the period of occupation of a site often can lead to information on the ethnic background and socioeconomic standing of the occupants, when used in conjunction with archival and chain-of-title data. Both types of data (i.e., artifact dates and chain-of-title) together often have been critical in evaluating the NRHP eligibility of an historic site. As in the previous study of historic artifacts from the LHAAP (Cliff and Peter 1992), dateable historic artifacts were used to determine general ranges of time, in order to provide an estimation

of the temporal period of occupation of the site. This artifact "time guide," along with any archival records available, was then used to provide a general understanding of the area and the living conditions of the people who were there (see Appendix C for a complete listing of the historic material recovered).

A total of 39 historical artifacts was recovered from three archeological sites and two localities within the 333 ha surveyed at the LHAAP, all of which was recovered from subsurface shovel tests. As in an earlier study (Cliff and Peter 1992), the analytical framework used for the historic artifact analysis follows South's (1977) artifact pattern analysis method. The historic artifacts recovered from the LHAAP sites were sorted into various categories, consisting of: (1) domestic, (2) architectural, (3) miscellaneous activities, (4) furnishings, and (5) personal items. The domestic category was used for items related to food service (e.g., tableware) and food storage (including food preparation). Many, although by no means all, of the ceramic and glass items were considered to be connected with food service or storage activities. The architectural category included all items related to buildings, such as brick, mortar, plaster, nails, window glass, and other miscellaneous artifact classes (such as electrical items) recovered during the research. The miscellaneous activities category is somewhat of a mixed assortment, which included any nonhousehold items, transportation- or farm-related equipment, and firearms. Furnishings included artifacts such as household items, furniture, stove parts, and lamp glass. A personal category was created for items of individual use, such as clothing, buttons, shoes, dolls, and smoking pipes. Finally, unidentified metal fragments and artifacts of ceramic or glass which were unidentifiable as to category, were not included in the analysis nor were they assigned a separate category, although they were tabulated. Although these categories tend to perpetuate ideas about functional artifact classes, it is felt that this is the most efficient analytical framework with which to examine this particular data set.

CHAPTER 4

FIELD SURVEY RESULTS

INTRODUCTION

This chapter presents the results of the field survey that was carried out at the Longhorn Army Ammunition Plant (LHAAP) during October of 1993. Of the four cultural resource sites located and recorded within the 333 ha (823 acres) surveyed, two of these sites (41HS240 and 41HS396) were relocations and reevaluations of previously recorded sites, while the other two (41HS539 and 41HS540) had not previously been recorded. In addition, five nonsite localities were located and recorded. Only one of the sites recorded by this survey had a prehistoric archeological occupation (41HS240, also known as the Harrison Bayou site), while the other three had only historic occupations, all of which were archeological in nature.

The remainder of this chapter presents the descriptions of each of the cultural resource sites and localities recorded by this project at the LHAAP, along with the evaluation of each site's eligibility for the National Register of Historic Places (NRHP). Since there are a limited number of sites, they have all been presented together in a single section. The artifact samples collected at all of the archeological sites were small and a discussion of this material is presented along with the site descriptions. Descriptions of the five localities are presented in a separate section which follows the presentation of the cultural resource site descriptions.

DESCRIPTIONS OF CULTURAL RESOURCE SITES

The Harrison Bayou Site (41HS240)

Site 41HS240 is the Harrison Bayou site, a previously reported site located on an upland ridge which projects westward into the floodplain of Harrison Bayou (Figure 3). The upland ridge is at an elevation of 55 to 58 m (180-190 ft) above mean sea level (amsl) and is approximately 4 to 5 m above the floodplain of Harrison Bayou. The area investigated during this project measured over 80 m long by 60 m wide (ca. 4,000 m² or 0.4 ha). The site is mapped as being on Eastwood very fine sandy loam, 1 to 5 percent slopes, a "deep, moderately well drained, very slowly permeable soil, formed in unconsolidated shaly marine sediments, mainly of the Wilcox geology" (Golden 1988). Eastwood very fine sandy loam typically consists of an 8-cm thick A horizon of dark yellowish brown (10YR 4/4) loam overlying a 12-cm thick EB

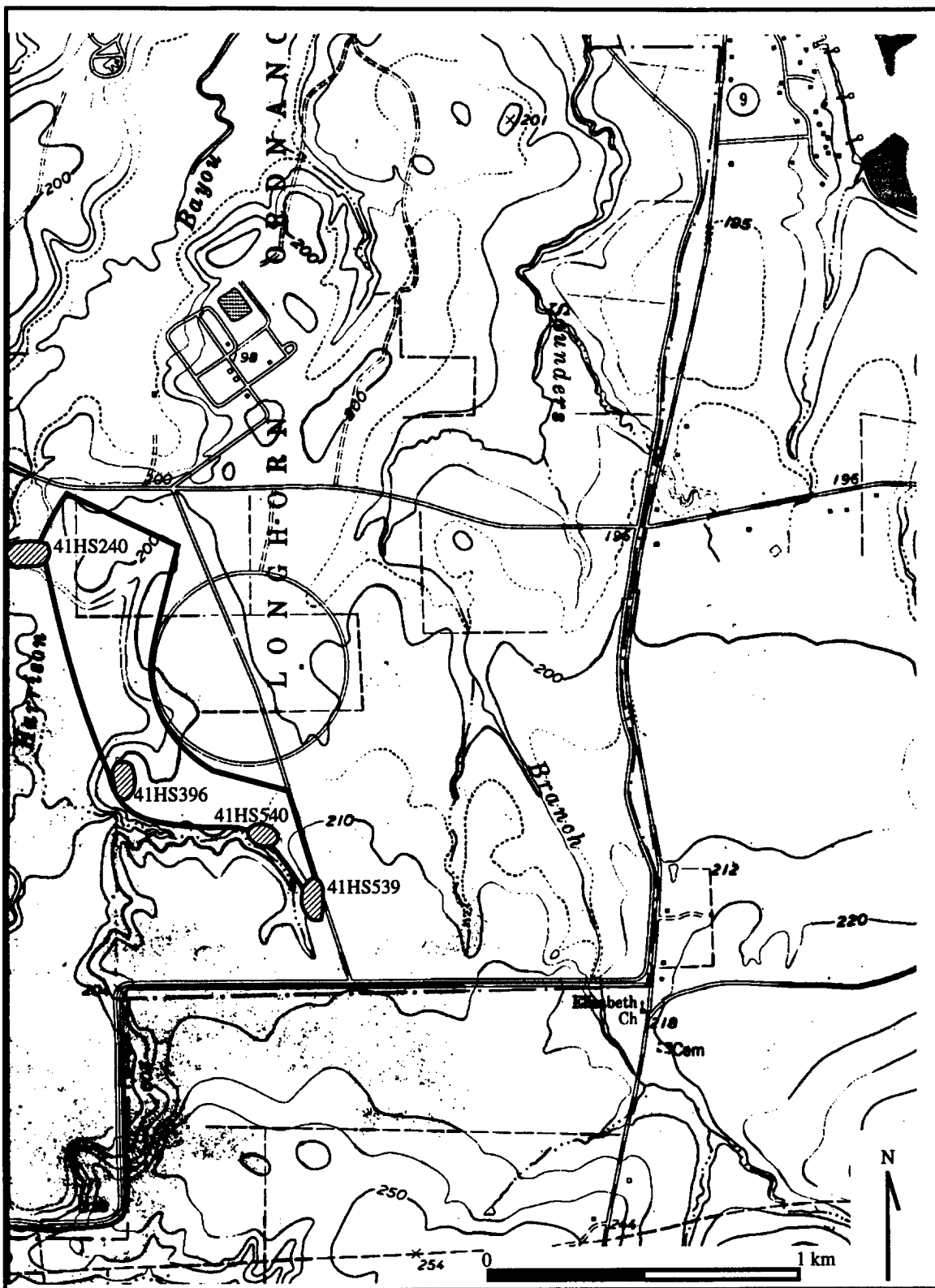


Figure 3. Map of MU 36 showing location of cultural resource sites recorded by the 1993 survey.

horizon of light yellowish brown (10YR 6/4) and strong brown (7.5YR 5/6) loam. The Bt subsoil generally consists of a red (2.5YR 4/6) clay more than 20 cm below ground surface.

The site area is presently covered with a mixed pine/hardwood forest, including pine, oak, and hickory, with cypress appearing on the adjacent bottoms of Harrison Bayou and an understory which includes greenbriar. The site is within the Eroded Uplands zone (Zone 3) of Peter and Stiles-Hanson (1990) but is immediately adjacent to their Zone 4: Alluvial Bottomlands (see Table 1). An estimated 85 percent of the site has had 30 to 60 cm of topsoil removed, presumably by bulldozer, with the original ground surface being present only along the edges of the terrace (Figure 4).

Previous Investigations

As has been mentioned previously, the Harrison Bayou site has been of more than unusual significance in the development of Caddoan studies in Northeast Texas and northwestern Louisiana. The site was apparently first visited and collected by Edward F. Neild, of Shreveport, Louisiana, between 1932 and 1935 (Ford 1936:77). Neild's collection from this site, consisting of 171 sherds and an unknown amount of stone tools and lithic artifacts, was subsequently described by James A. Ford (1936:96) in his initial formulation of a Caddo ceramic complex. In his 1936 report, Ford summarized the Harrison Bayou site as follows:

The Harrison Bayou site is on the eastern side of the small stream of that name, three miles west of the point where the Texas-Louisiana boundary line touches the south side of Caddo Lake. The site is located in the state of Texas, due west of Caddo Parish, Louisiana.

The midden deposit is rather extensive and occupies the side of a very steep hill on the eastern side of the bayou. Cultivation and the resulting erosion have exposed quantities of refuse material. Results of the classification of the one hundred and seventy-one decorated sherds secured from the site by Neild are shown in figure 1 [sic]. Representative types are illustrated in figure 18 [sic]. Most of the material can be referred to the Caddo complex. Small percentages of Coles Creek are found. Deasonville is present in even smaller percentages and less determinate types [Note: *the Deasonville phase is now considered to be part of the Baytown period (Phillips 1970:Figure 2, 11)*].

The collection best shows the variety of stone artifacts that characterize Caddo collections. Most to the material illustrated in figure 15 [sic] has come from this site (Ford 1936:96).

Elsewhere in Ford's report, the Harrison Bayou site was tabulated as having an approximate area of 3.24 ha or 32,374.85 m² (8 acres), a cultural deposit with a thickness of more than 24.4 cm (10 in), and a collection containing artifacts of Caddoan, Tunican, Deasonville, and Coles Creek affiliation (Ford 1936:97).

Twelve years later, in 1948, Clarence Webb used a larger sample of 237 sherds from the Harrison Bayou site, along with collections from a number of other sites, as the basis for his definition of the Bossier focus (Webb 1948). In regard to the material from the Harrison Bayou site, Webb (1948:Table II) specifically noted the presence of Maddox Engraved (Ford 1936:Figure 18b), Taylor Engraved, Pease Brushed-Incised (Ford 1936:Figure 18d, e, & f), Dunkin Incised (late variant), Bossier Brushed, and Belcher Ridged. The latter type was identifiable only in Ford's collection (1936:Figure 18i). In addition to artifacts of the Bossier focus, Webb (1948:Table 1) also noted the presence at the Harrison Bayou site of material which he associated with the Coles Creek period (e.g., Coles Creek Incised, Mazique Incised, French Fork

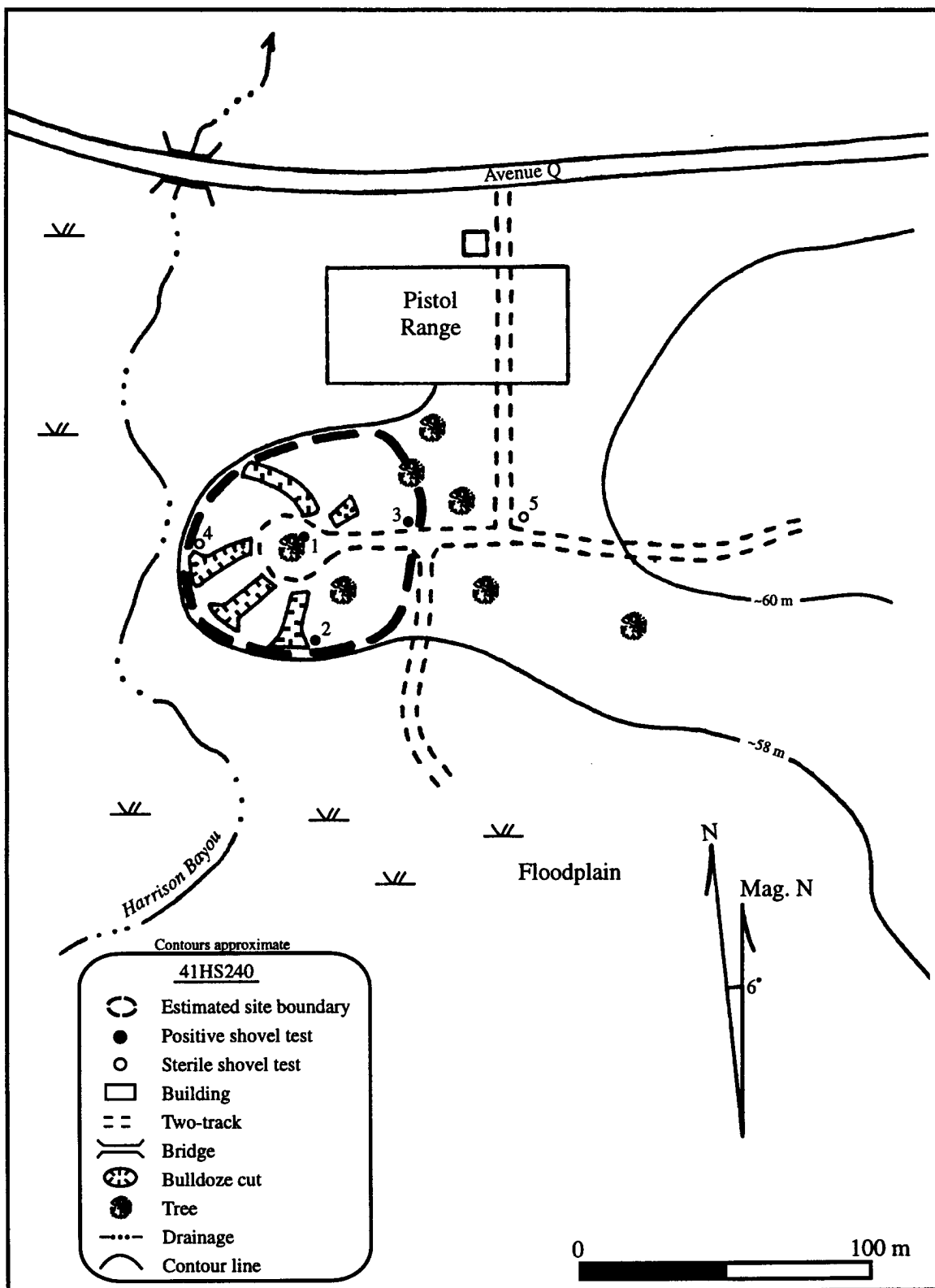


Figure 4. Plan map of site 41HS240, Longhorn Army Ammunition Plant, Harrison County, Texas.

Incised, Chevalier Stamped, and Evansville Punctated, *var. Rhinehart*) and the Alto focus (Pennington Punctated-Incised, Weches Fingernail Impressed, Crockett Curvilinear Incised, Hickory Engraved, Holly Fine Engraved, and Evansville Punctated, *var. Wilkinson*) in what he termed "appreciable amounts" (Webb 1948:124). Unfortunately, Webb does not specifically mention which of these types were present at the Harrison Bayou site, but Ford appears to illustrate several varieties of Coles Creek Incised (Ford 1936:Figures 18m, 18p, 18q, & 18r), Evansville Punctated, *var. Rhinehart* (Ford 1936:Figure 18n), Evansville Punctated, *var. Evansville* (Ford 1936:Figures 18h & 18k), Weches Fingernail Impressed (Ford 1936:Figure 18o), and Crockett Curvilinear Incised/French Fork Incised (1936:Figure 18l). Webb also mentioned the presence of stem or bowl fragments of long stemmed pipes at the Harrison Bayou site, which he suggested resulted from the Alto focus component (Webb 1948:127). In regard to lithic artifacts, Webb noted that at the Harrison Bayou site large projectile points were "3 to 10 times as numerous as the small points" (Webb 1948:128). Webb also specifically mentions "portions of a greenstone gorget (3 hole?), granite boatstone and slate bead (small biconical bannerstone?) collected by Neild from the Harrison Bayou site" (Webb 1948:234) and illustrated by Ford (1936:Figure 15i, j, & k). A reevaluation of the Bossier focus in 1983 added no new information regarding the Harrison Bayou site (Webb 1983).

The Harrison Bayou site was revisited in 1968 by Jon Gibson of SMU as part of a brief reconnaissance of Caddo Lake, at which time he made an additional surface collection there. Gibson seems to have been the last archeologist to see the site intact (although apparently greatly reduced in size), and he had the added advantage of access to at least some of the material from the site in private collections. For this reason, Gibson's discussion of the site, although relatively extensive, is reproduced in its entirety below (Gibson 1970:26-29):

Harrison Bayou (X41Hs1) [Note: at this time, SMU maintained its own system of site designation, prefaced by the letter "X"]: The Harrison Bayou site is on Harrison Bayou 0.2 miles south of the main gravel road which traverses the Longhorn Army Ammunition Plant at the LAAP Pistol Range, about two miles east of Karnack. The geographic coordinates are 94° 07' 25" n. latitude and 32° 47' 08" w. longitude. The site covers about an acre of sandy L-shaped ridge crest in the "Mixed Hardwood-Pine Ridges and Hills" microenvironment about 20 meters east of Harrison Bayou [note that Gibson's estimate is significantly less than Ford's - Ed.]. Animal burrows show the heavily stained midden to be 0.7 meters in some places. Most of the cultural material [see Table 4 - Ed.], was recovered from a fire lan [sic], which had recently been turned across the occupied area disrupting any patterning the artifacts might have exhibited.

In 1936, Ford published a brief description of the site and a breakdown of a group of 171 sherds which had been collected by Edward Neild (Ford 1936: 96, Table 1). Although the types are classified by a complicated numerical attribute system, some are recognizable under the current binomial scheme. Following are the types which have been identified. Ford's corresponding numerical types and identifying illustration references are given in parenthesis.

- a) Weches Fingernail Impressed (61:24:6, 61:24:7, Fig. 18 n, o).
- b) Kiam Incised (or Wilkinson Punctated, 11/21:61, 71:21, Fig. 18 h, k).
- c) Crockett Curvilinear Incised (Fig. 18 l).
- d) Hardy Incised [Note: now known as Coles Creek Incised, *var. Hardy*] (61:24:6, Fig. 18 r).
- e) Coles Creek Incised (61:24:6, Fig. 18 p).
- f) Pease Brushed-Incised (60:61/64, 41:21:3, Fig. 18 d, f, g).
41/21
- g) Belcher Ridged (63:42, Fig. 18 i).
- h) Maddox Engraved (41:21:, 2, Fig. 18 b).
28
- i) Harrison Bayou Incised (71:21, 61:24:9, Fig. 18j, q).

Proportions of the ceramics relating to individual components cannot be computed. Of the 93 decorated sherds, 42 fragments (or 45.1 percent) are subsumed under the rubric, "Caddo." Furthermore, it is probable that a large percentage of those grouped under "Tunica" (two sherds), "Deasonville" (three sherds), and "unrelated" (22 sherds) are "Caddoan." Difficulties with Coles Creek elements (22 sherds) in this area have been discussed previously. Since Ford's pioneering work predated the separation of various Caddoan units by some decades, quantification by specific components cannot be achieved below this gross level of analysis.

No additional pottery types were recovered by the survey [*that is, by Gibson*] and the sample is too small and selective for statistical interpretation. Paste features are not discordant with local clay features. In fact, the humic-enriched clays of the banks of Harrison Bayou 20 m west of the residential area were probably the immediate source. With few exceptions, the sherds are dark in color and contain vegetal inclusions. Four examples from the survey collection have reddish or beige slips. Aplastics include sand, grit, grog, bone, and shell. Other typical "Caddoan" characteristics are carinated bowls and bottles (Ford 1936:94).

Chipped stone artifacts are not plentiful, due possibly to intensive local collecting. A primary flake and five biface thinning flakes are the total waste from projectile point manufacture or repair. An Ellis (or Motley) is the only identifiable dart point in the present collection, but the Neild holdings contained several Early to Middle Archaic forms, including Pogo, Frazier, Big Sandy, San Patrice, and Plainview (Ford 1936:Fig. 15). Arrow points are represented by two specimens of the Perdiz type. Apparently, arrow points were formerly quite numerous, and many have been collected by Mr. Bickham Wood of Marshall, Texas. Similarly, the Neild and Webb collections have an undisclosed number.

Several polished stone objects are illustrated by Ford with the notation that, "Most of the material . . . has come from this site (Harrison Bayou)" (Ford 1936:Fig. 15, 94). The items designated l and m are from the Sinner Site in Bossier Parish, Louisiana, and so may be omitted. Presumably, the remainder are from Harrison Bayou. A bi-perforated greenstone gorget with scalloped margins, a flattened barrel-shaped bead of banded brown slate, and a fragmentary boatstone of gray granite attest to a considerable proficiency in working hard stones. Manufacture of these artifacts at the site cannot be demonstrated with present evidence. The rough ground stone category includes a pitted stone-fabricator.

The wealth of material obviously deriving from different occupations and the failure of the survey to ascertain any particular patterning among the various artifacts makes it very difficult to discuss site function and activities for the individual components, and infer relationships to the total adaptive settlement systems. Some general observations may be pertinent, however.

With regard to the Archaic component (or components), the presence of dart points may suggest that at least a portion of the economic adaptation was devoted to hunting. The polished stone items may have had aesthetic importance, although it is highly possible that they (particularly, the gorget) may have served utilitarian function [*sic*] (atlatl weights, wrist guards, etc.). Each is broken. Comparable items have been found at many Archaic sites in northern Louisiana. Large numbers often show breakage along similar planes, as if the application of undue stress was similarly applied.

Boatstones and more commonly gorgets quite often show evidence of repair along these breaks. This could mean several things: one, that the expenditure of time and labor involved in their production could ill-afford to be spent in making new objects every time one broke; or that the objects were distributed within a system of reciprocal exchange and among groups whose individual members were

differentially specialized. The implications of this latter possibility in terms of adaptive and social structures are discussed later.

The "Caddoan" occupation at Harrison Bayou was extensive, intensive, and probably of lengthy duration. However, this is not to necessarily imply continuous inhabitation by sedentary villagers. Coles Creek, Alto, Bossier, and "Late" components are represented. The nature of each is undeterminable at present with reference to ecological adaptations and settlement characteristics. The occurrence of bone temper in some Alto potsherds and of shell temper in a few of the "Late" ceramics may indicate exploitative techniques of hunting and collecting, but the importance of these facets to the total economic picture is unmeasurable.

Table 4
Material Collected from the Harrison Bayou Site (41HS240) by Gibson (1970:Table 7)

Artifact Type	Frequency	Remarks
Lithics		
Dart Points		
Macon	1	Made of novaculite.
Unidentified	1	Distal fragment.
Arrow Points		
Perdiz	2	
Pitted stone-abrader	1	Made of ferruginous sandstone.
Debitage and Debris		
Primary	1	
Eclat de Taille	5	
Ceramics		
Plain	17	Temper includes bone, grog, sand, and other.
Slipped	4	These are reported to orange, red, or beige slips.
Pease Brushed-Incised	2	
Dunkin Incised or Coles Creek Incised, <i>var. Hardy</i>	1	
Weches Fingernail Impressed	1	

In his concluding section, Gibson (1970:32-33) discussed archeological comparisons between the sites he visited in the Caddo Lake area, including the Harrison Bayou site, and remains elsewhere in the region, especially in northwestern Louisiana:

The Archaic component at the Harrison Bayou site (X41Hs1) seems to conform in a general way to a widespread North Louisiana "Hills" Archaic. The apparent retention of Early Archaic dart points in an assemblage characterized by boatstones, perforated gorgets, stone beads, and pitted stones provides a basis for identification of this "complex." Similarities with materials to the east and northeast are far greater than with those to the west. It is argued here that the Northwest Louisiana

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Archaic sites represent far more than archaeological components with trait lists similar to that of the type site of Poverty Point. It is suggested that these are but one group of sites (satellites) engaging in a redistributive exchange system, upon which the nucleus of Poverty Point site [*sic*] itself was built. More explicitly, this relationship is seen as an exchange of certain artifact forms and possibly a labor force for spiritual or materialistic satisfaction--perputed [*sic*] under the integrating bonds of some, as yet undetermined, social mechanism.

Sites yielding "Caddoan" pottery, such as . . . X41Hs1, are directly comparable in ceramic types and proportions to many sites in the Red River drainage. This would seem to indicate a certain degree of unity in the Eastern portion of the Caddo area. Unfortunately, the present data and analysis are insufficient to provide evidence, for or against, the presence of confederations in the area in prehistoric times. Such support may be forthcoming from current studies (J. Ned Woodall, 1969). It is believed that such an organization will undoubtedly be late in the prehistoric sequence--immediately prior to European contact.

The occurrence in the Caddo Lake region of dart points made of novaculite, and polished stone artifacts of greenstone, slate, and granite is indicative of external connections with the Central Arkansas area where this material occurs in abundance. Whether this stone was derived through exchange or locally-sponsored expeditions is at present unascertainable, although the former explanation is preferred.

Finally, as part of his Masters' research, Peter Thurmond reevaluated the Harrison Bayou site and apparently filled out its first TARL form in 1979. Unfortunately, Thurmond's evaluation of the site was made without an actual site visit (TARL 1979), making heavy use instead of the visit made by Gibson more than 10 years before. It is also not clear from the form whether or not Thurmond personally examined the collections available (TARL 1979). Thurmond concludes his evaluation on the form by stating (TARL 1979):

The dart points, polished stone, and pitted stone suggest the use of the site during the period of transition from Paleo-Indian to Archaic, probably as a temporary camp. Midden accumulation indicated a more permanent occupation during Caddoan times, and the area cited by the surveyors suggests a hamlet-sized occupation. The pottery collections suggest that the inhabitants of this later component at the site were temporally transitional between the classic Gibson and Fulton cultures of the area, and were spacially [*sic*] transitional between the archeological cultures previously identified in northeast Texas and northwest Louisiana. Traits indicative of the Alto and Bossier foci are predominant.

In his subsequent overview of the Cypress Creek drainage basin, Thurmond summarized the site as follows (Thurmond 1990:167):

The site has been subjected to numerous uncontrolled surface collections by private collectors and professional archeologists since the 1930s. The most recent collection was made by J.L. Gibson for SMU in 1968 during the Caddo Lake Enlargement survey.

Gibson (1969:26-29) reports that various investigators have recovered numerous sherds, both plain and decorated, including the types Coles Creek Incised, Crockett, Kiam, Weches, Pease, Sinner, Maddox and Belcher R.; numerous Perdiz arrow points; dart points of the types Gary, Ensor, Ellis, San Patrice and Plainview; a biperforated greenstone gorget with scalloped edges; a barrel-shaped bead of polished slate; a granite boatstone; pitted stones; and lithic debitage. There is a midden deposit of dark, greasy soil up to 70 cm in thickness. Total area of the site is about 4000 sq m (*ibid*).

Webb (1948:123, 125) analyzed a sample of 237 sherds from the site and found 29.8% to be diagnostic of the Bossier phase, 5.2% diagnostic of the Early Caddoan period and 65.0% chronologically non-diagnostic. The Bossier phase diagnostics were sherds of the types Maddox E. (.8%), Taylor (2.0%), Pease (27.0%), "Dunkin Incised, Late Variant" (14.3%) and "Maddox Brushed" (41%) [*now known as Bossier Brushed*]. The "Dunkin" sherds are from everted-rim jars with complicated pattern incised rims, and many are probably assignable to the types Maydelle and Pease.

Apparently, then, the primary component is a Bossier phase small settlement, but there are also Late Paleoindian, Middle Archaic and Late Archaic components of unknown intensity, and minor Coles Creek/Early Caddoan component(s). It is noteworthy that a component dominated by Bossier phase diagnostics should occur as far west as Caddo Lake The composition of the sherd collection from 41HS11 . . . suggests that a major social group boundary existed between the two sites on a Bossier/Whelan time level.

Current Investigations

The Harrison Bayou site was revisited on several occasions during the course of the present survey, an updated site form was filled out, a sketch map of the site area was made (see Figure 4), and a series of photographs was taken showing the present condition of the site. Five shovel tests were excavated in various areas of the ridge, in an attempt to locate any preserved cultural deposits, but only three were found to contain artifactual remains. Shovel Test 1 was placed in the approximate center of the site, adjacent to a large pine tree, where the uneven ground surface indicated the presence of preserved topsoil. This shovel test yielded a sherd and a fragment of chipped stone within 20 cm of the ground surface. Shovel Test 2 was placed on the extreme southern edge of the ridge above Harrison Bayou, in between bulldozer piles, and yielded four pieces of chipped stone and two sherds between 20 and 40 cm down. Shovel Test 3 was located about 50 m east of the datum and yielded one sherd within 20 cm of the ground surface. Shovel Test 4 was placed on the extreme western edge of the ridge and Shovel Test 5 beyond the eastern edge of the site. Both of these tests were found to be sterile. These shovel tests generally showed that in the few places where undisturbed deposits remained on the site (i.e., adjacent to trees and near the edge of the ridge) they consisted of a deeper than expected combined, loamy AE horizon over a clay Bt horizon. The three positive and one sterile shovel test excavated within the site boundaries at the Harrison Bayou site yielded an average subsurface density of 2.25 artifacts per shovel test.

In addition to the limited shovel testing, a small sample of fill from one of the bulldozer piles was screened to check for cultural remains in disturbed context. This effort yielded two pieces of baked clay and one piece of lithic debris with little effort, suggesting that much of the site presently resides in redeposited bulldozer backdirt piles. No features were observed during the course of these investigations, and no sign of the "0.7 meter" midden deposits noted by Gibson 15 years ago could be found. Apparently, either Gibson overestimated the thickness of this deposit (a not-unlikely circumstance, given that it was only observed in animal burrows) or the heavy disturbance that the area seems to have undergone in the last 15 years has totally destroyed it.

Artifacts

The most recent investigations carried out at the Harrison Bayou site resulted in the recovery of a sample of only 12 artifacts, including one early aborted biface, five pieces of lithic debris, four ceramic sherds, and two fragments of baked clay (see Appendix B). The sample of lithic remains consists of a variety of

cherts, ranging from red to yellowish brown to white in color. The aborted biface is oblong in shape, shows no evidence of reuse, and was apparently rejected due to a failure to thin. The few flakes were all less than 6.3 mm across and appear to have been produced during the bifacial reduction of small cobbles, probably derived from stream channels or upland lag deposits.

The four ceramic sherds recovered from the Harrison Bayou site during these investigations include three decorated body sherds and one small rim sherd (Table 5). Despite the small size of the body sherds, it appears likely that the types Pease Brushed-Incised and Dunkin Incised, Late variant are represented. The single rim sherd is small and shows no trace of any decoration. The rim is thinned, with a flat lip. Deliberate tempering material probably includes grog and bone, and possibly hematite, with two of the sherds having a high density of medium to fine sand included in the paste. The two fragments of baked clay recovered from the bulldozer backdirt pile are actually portions of a single, heavily eroded piece. Although one side is flat and the other is convex, there is no definite indication that the piece originated from a wattle-and-daub structure. No trace of any impressions are present.

Table 5
Ceramics Collected from the Harrison Bayou Site (41HS240), 1993

Unit No.	Level No.	Art. No.	Aplastics	Decoration	Suggested Type Designation
S.T. 1	1	0	Grog (<1 mm)	Parallel brushed-incised lines	Pease Brushed-Incised
S.T. 2	2	1	Grog (<1 mm); Sand (0.25-0.5 mm)	None	Unidentified
S.T. 2	2	2	Bone (<2 mm); Hematite (<2 mm)	Parallel brushed-incised or incised lines	Pease Brushed-Incised or Dunkin Incised, Late variant
S.T. 3	1	0	Hematite (<2 mm); Sand (0.12-0.25 mm)	Incised parallel line-filled triangles	Dunkin Incised, Late variant

Summary

The Harrison Bayou site (41HS240) may at one time have been a relatively large prehistoric site (Ford's estimate of 3.24 ha may be too high, while Gibson's estimate of 0.4 ha is in agreement with the present survey) with midden deposits which may have gone as deep as 70 cm below ground surface, located on an flat upland ridge overlooking the floodplain of Harrison Bayou. For over 30 years it served as a source for surface collections for a number of researchers and collectors in Northeast Texas, and ceramic samples from the site were instrumental in the definition first of a "Caddo Ceramic Complex" (Ford 1936) and then of the Bossier focus (Webb 1948). As late as 1968, the site may still have contained well preserved and deep midden deposits, but in the last 25 years or so, the site has been heavily impacted by bulldozing, with minimal intact deposits remaining only on what were apparently the margins of the site area.

Data collected from the site over the years suggests that the location was used intermittently, possibly as early as the Late Paleo-Indian, and probably throughout the Archaic, as revealed by the presence of apparent Early, Middle, and Late Archaic point styles. Certainly, multiple reoccupations seems like a more

reasonable hypothesis than does "the apparent retention of Early Archaic dart points" in a later assemblage. The presence of boatstones, gorgets, stone beads, and pitted stones suggests more than a short-term occupation, as well as indicating relations with Poverty Point-influenced groups to the east, as Gibson (1970) suggests. Certainly, an eastern orientation for the occupants of the site is confirmed for the later ceramic periods, first when Formative-Early Caddoan material is well mixed with Coles Creek remains and subsequently when the site falls within the orbit of the Bossier phase, centered on the middle Red River area in Louisiana (Webb 1983). Interestingly, Perdiz points are the only arrow points mentioned by name as being recovered from the Harrison Bayou site, although the Bossier phase is reportedly associated only with Bassett, Colbert or Ashley, Alba, and Hayes types (Webb 1948, 1983). If the identification of these points as Perdiz is accurate, they may indicate an occupation of the Harrison Bayou site late in the Bossier phase.

Despite the fact that much of the Harrison Bayou site appears to have been destroyed by government activities over the last 30 years, the site may have some research potential left. Although approximately 85 percent of the site appears to have been bulldozed, some subsurface deposits may remain at the base of trees and on the periphery of the bulldozed area. In addition, given the apparent function of Harrison Bayou as a residential site during at least part of the prehistoric period, it is possible that subsoil features, such as postholes, pits, and burials, may remain below the level of disturbance at the site. In light of these possibilities, as well as in consideration of the site's historical importance for the development of Caddoan archeology in East Texas, it is recommended that the Harrison Bayou site (41HS240) be considered of unknown eligibility for inclusion in the NRHP, and that further subsurface investigations be undertaken before a final determination of its National Register status be made.

Site 41HS396

Site 41HS396 is an historical site situated on an upland bench which slopes westward down to the floodplain of Harrison Bayou (see Figure 3). An unnamed drainage which flows west-northwest into Harrison Bayou is located below the site to the south (Figure 5). The site is situated at an elevation of approximately 67-70 m (200-210 ft) amsl and covers an estimated area of 5,200 m² (ca. 80 m x 80 m). The site is mapped as being on Scottsville very fine sandy loam, 0 to 2 percent slopes, a "deep, moderately well drained, very slowly permeable soil, formed in thin loamy sediments over clayey deposits of the Wilcox formation" (Golden 1988). Scottsville very fine sandy loam typically consists of a 10-cm thick A horizon of dark brown (10YR 4/3) fine sandy loam overlying a 20-cm thick E horizon of yellowish brown (10YR 5/4) fine sandy loam. The Bt subsoil generally consists of a yellowish brown (10YR 5/6) loam or clay loam more than 30 cm below ground surface. Vegetation observed on the site consisted of a moderate density mixed pine/hardwood forest containing pines, oak, sweetgum, and hickory, with a low density understory consisting of grapevine, French mulberry, sweetgum, maple, and hickory saplings. One ornamental plant, a redbud, was also observed. The site is within the Eroded Uplands zone (Zone 3) of Peter and Stiles-Hanson (1990) but is immediately adjacent to their Zone 4: Alluvial Bottomlands (see Table 1). The field crew estimated that less than one percent of the above-ground historic remains were still present, but that only five percent of the site deposits had been destroyed as the result of erosion, bioturbation, and bulldozing.

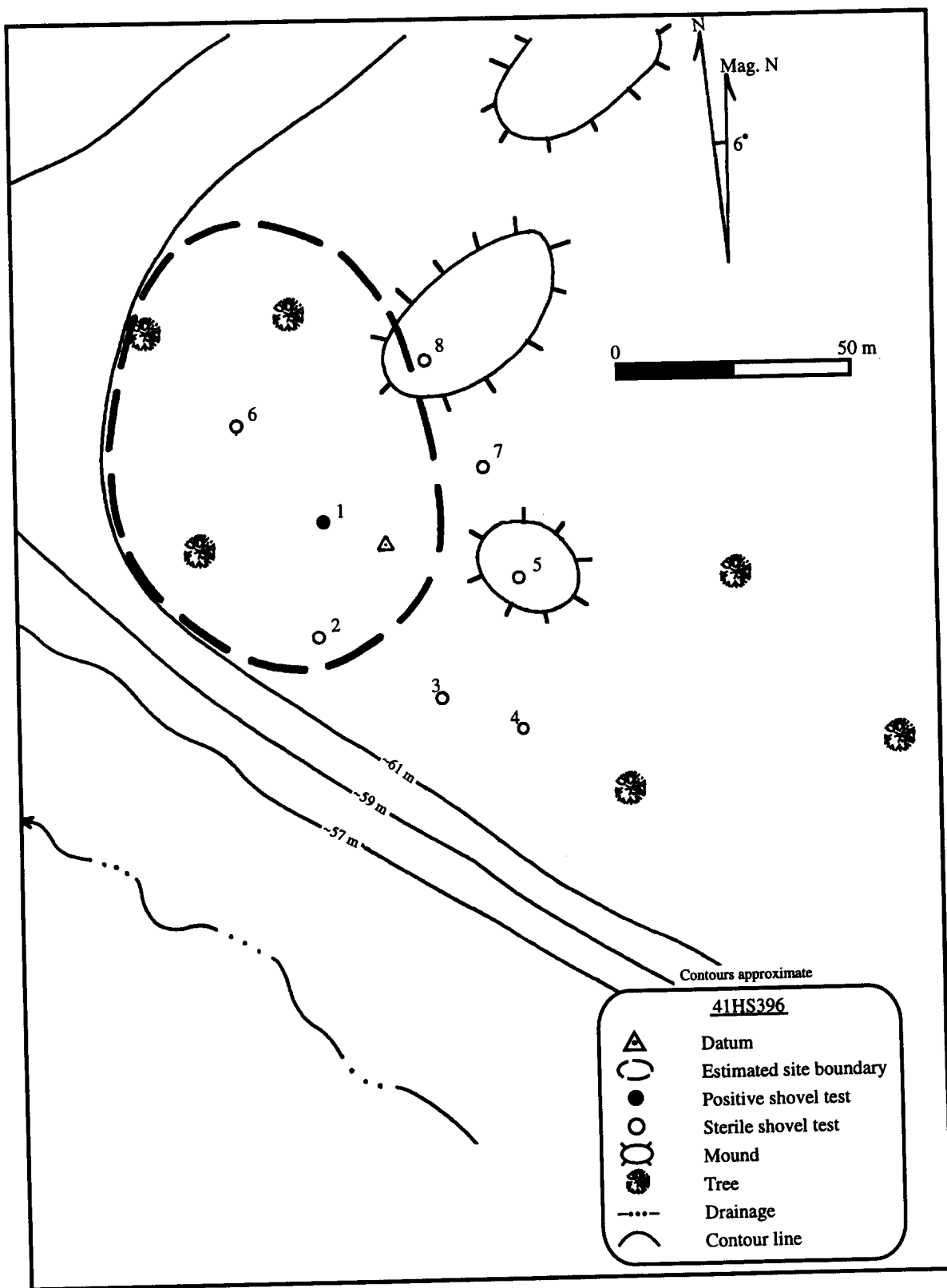


Figure 5. Plan map of site 41HS396, Longhorn Army Ammunition Plant, Harrison County, Texas.

Previous Investigations

Site 41HS396 was originally recorded in 1988 by archeologists from the U.S. Army Corps of Engineers, Fort Worth District (Roemer and Newman 1988). At that time, the site area was described as follows (Roemer and Newman 1988:15):

A distinctive upland projection near the southwestern part of the study area was investigated. . . . Dense vegetation including pine trees covered this area, which appears relatively clear with some trees along a fence line on the 1942 air photo-map. A historic site was discovered here by screened shovel testing . . . and has been assigned the designation 41HS396. Of 3-4 tests in this area, one produced window pane sherds at less than 20 cm depth, and a second test resulted in a whiteware sherd, a wire nail, a square nail, a metal strap fragment, a natural piece of silicified wood, and some hardened unidentified seeds similar to that of *Vigna sinensis*.

Unfortunately, no map was made of the site area, the probable site limits were not identified, and no permanent datum was placed on the site at this time. Following the initial recording, the NRHP-eligibility status of site 41HS396 was determined to be unknown (TARL 1988) and it was stated that the site would "be included in future cultural resource management plans at the Longhorn Army Ammunition Plant" (Roemer and Newman 1988:17).

Current Investigations

During the present survey at the LHAAP, site 41HS396 was revisited by the GMI field crew. A total of eight shovel tests was dug, of which only one (Shovel Test 1) contained any cultural material -- a whiteware sherd found within the upper 20 cm of deposit. Since Roemer's shovel tests (Roemer and Newman 1988) could not be relocated and only one GMI shovel test proved to be positive, definition of probable site limits by the present investigators was based on current surface topography (see Figure 5). Using these tentative site limits, three of the GMI shovel tests were excavated on the site, for an average artifact density of only 0.33 artifacts per shovel test. If the two additional positive shovel tests reported by Roemer and Newman (1988:15) are included with a minimum of six additional artifacts (a minimum of two window glass fragments, one whiteware sherd, one wire nail, one square nail, and one metal strap fragment), the average subsurface density rises to 1.4 artifacts per shovel test. The shovel tests excavated by GMI at the site revealed that little or nothing of the A horizon was left and that the E horizon consisted of a yellowish brown (10YR 5/4 - 5/6) loam or sandy loam, which was underlain at depths varying from 18 to 40 cm by a brownish yellow (10YR 6/6) silty clay Bt horizon. The lack of an A horizon suggests that deflation has occurred at the site. No features were observed in any of the shovel tests or on the surface of the site.

The only artifact recovered by the GMI shovel testing at site 41HS396 was a single undecorated, very light blue tinted whiteware basal sherd from Shovel Test 1 (see Appendix C). This type of whiteware is estimated to date between 1880 and 1930. This particular sherd shows evidence of some burning along the footring. Of the artifacts reported by Roemer and Newman (1988), the wire nail may be dated subsequent to 1880, while cut nails are usually dated between 1840 and 1900.

Summary

Site 41HS396 is an historic archeological site covering an estimated 5,200 m² with a subsurface artifact density of only 0.33-1.40 artifacts per shovel test. The site is situated on an upland edge overlooking Harrison Bayou and was probably occupied from the late nineteenth century into the early twentieth century. The site appears to be located on the far southeastern edge of the J.M. Cox Survey, adjacent to the Calvin Fuller Survey (Peter and Stiles-Hanson 1990:Figure 3). The former was patented on January 17, 1867, and the latter on June 7, 1849 (Peter and Stiles-Hanson 1990:Table 1). No structures are shown in the vicinity of site 41HS396 on a 1913 map of Harrison County (Van Duyne and Byers 1913), but it cannot be determined whether site 41HS396 dates prior to 1913 or subsequent to 1913. The low density of material observed at the site may indicate a short-term occupation.

The current evaluation of site 41HS396 is that it has suffered extensive disturbance from erosion, bioturbation, and bulldozing. Based on this level of disturbance, as well as on the low density of artifacts and the lack of any identifiable features, site 41HS396 is felt to have little remaining research potential and is therefore recommended to be ineligible for inclusion in the NRHP, with no further work required.

Site 41HS539

Site 41HS539 is an historical site located on an upland edge overlooking a small, unnamed tributary which flows north and then west into Harrison Bayou (see Figure 3). The site is situated at an elevation of approximately 70-73 m (210-220 ft) amsl and occupies an estimated area of 10,000 m² (ca. 170 m north-south x 75 m east-west). It is covered with a moderately dense mixed pine/hardwood forest consisting of pine, oak, and hickory and an understory comprised of French mulberry, sumac, briar, hedge, and pin oak. Two large hickory trees and a chinaberry tree were also noted at the site. The site is within the Eroded Uplands zone (Zone 3) of Peter and Stiles-Hanson (1990) but is not far from their Zone 4: Alluvial Bottomlands (see Table 1). The site area is mapped as being on the boundary between the proposed Latex fine sandy loam, 1 to 3 percent slopes, and the Metcalf-Cart complex, 0 to 2 percent slopes (Golden 1988). Latex fine sandy loam is described as including "deep, well drained, slowly permeable soils, that formed in loamy sediments over clayey deposits on the tertiary uplands" (Golden 1988). It typically consists of an 8-cm thick A horizon of dark brown (10YR 4/3) fine sandy loam overlying an 18-cm thick E horizon of brown (10YR 5/3) fine sandy loam. The Bt subsoil generally consists of a strong brown (7.5YR 5/6) to yellowish brown (10YR 5/6) clay loam more than 25 cm below ground surface. Metcalf soils consist of "deep, somewhat poorly drained, very slowly permeable soils that formed in thin loamy sediments over clayey deposits," while Cart series soils are deep, well drained, moderately slowly permeable soils "formed in loamy windblown and alluvial sediments" (Golden 1988). Metcalf soils typically consist of an 8-cm thick A horizon of dark grayish brown (10YR 4/2) silt loam, over a 12-cm thick E horizon of light yellowish brown (10YR 6/4) silt loam, over a Bt horizon of yellowish brown (10YR 5/4 - 5/6) loam or clay loam deeper than 20 cm. Cart series soils typically consist of a 10-cm thick brown (10YR 4/3) A horizon, over a 48-cm thick yellowish brown (10YR 5/4 - 6/4) E horizon, over a yellowish red (5YR 4/6) to strong brown (7.5YR 5/6 - 5/8) loam or clay loam below 58 cm. Disturbances noted to the site area included erosion and bulldozing. The field crew estimated that only one percent of the above-ground site remained intact; but that 95 percent of the site deposits were still intact, the remaining five percent having been destroyed by erosion.

Ten shovel tests were excavated in the vicinity of site 41HS539, of which five were found to contain 15 historic artifacts and one piece of burned sandstone (Figure 6). The site boundary, however, was defined on the basis of the distribution of surface artifacts, features, and ornamental plants, with nine of the 10 shovel tests excavated falling within the site boundary, for an average subsurface density of 1.78 artifacts

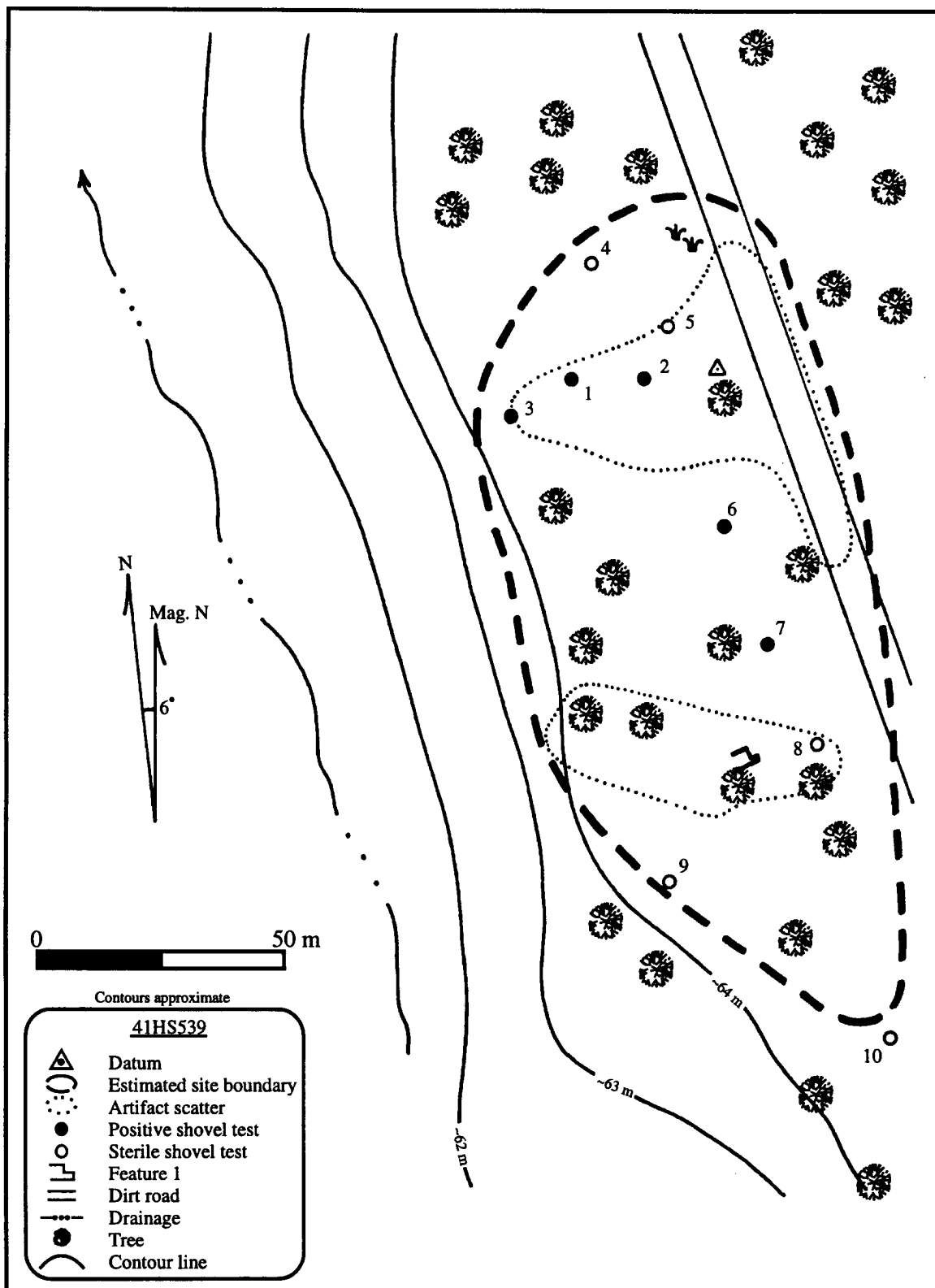


Figure 6. Plan map of site 41HS539, Longhorn Army Ammunition Plant, Harrison County, Texas.

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per shovel test. The sediment profiles revealed in the shovel tests suggest that the area is covered with Cart series soils, with a largely eroded or removed A horizon of brown (10YR 5/3) fine sandy loam present only in the upper 20 cm of Shovel Test 3; an E horizon of yellowish brown (10YR 5/4) sandy loam which generally went to 35 to 40 cm down over most of the site; and a Bt horizon of strong brown (7.5YR 4/6) silty clay below that. In Shovel Tests 6 and 7, the E horizon was found to go as deep as 50 to 60 cm below surface, while Shovel Test 10 contained only 9 cm of E horizon over subsoil, apparently due to bulldozing in this area. Where present, artifactual remains were generally confined to the upper 20 cm of deposit, except in Shovel Tests 3 and 7 where they were recovered between 20 and 40 cm. On the basis of the almost total lack of an A horizon, it appears that extensive deflation has occurred on the site.

In addition to the historic artifacts recovered from the shovel tests (see below), whiteware and glass fragments were found on the surface of the dirt road along the eastern edge of the site, while barbed wire, a bucket, a piece of stovepipe, hogwire, and a large cylindrical metal tube approximately 2 m long and 50 cm in diameter (possibly a boiler section or water heater core) were observed on the surface of the site. One feature was identified at site 41HS539. This consisted of a 1-x-1 m square of mortared, hand-pressed, reddish orange brick, of poor form and quality. Fragments of slag or clinker were observed in some of the bricks. This feature was filled to ground surface and was identified by the field crew as a well housing. An alternative possibility is that Feature 1 is the remains of a small steam-powered sawmill, with the metal cylinder mentioned above being its boiler. In addition, the unnamed drainage west of the site appears to have been dammed with an earthen berm at some time in the past.

Artifacts

As noted above, 15 historic artifacts and one piece of burned sandstone were recovered from shovel tests at site 41HS539 (see Appendix C). The most predominant artifact type recovered was bottle glass (n=10). A small, whole, opaque milk glass cosmetic jar with a continuous thread lip finish and *Hazel Atlas* (1920-1964) maker's mark on the base was recovered from Shovel Test 1. It measures approximately 6.8 cm high by 5.6 cm wide, and has a slightly squared shape. Other bottle glass recovered included undiagnostic body sherds of clear, aqua, and manganese decolorized (1880-1920) glass, some showing evidence of exposure to extremely hot temperatures resulting in melting and distortion of the sherds. One of these was a clear, continuous thread fruit jar lip. A single clear sherd from a lamp globe was also recovered. One piece of slightly burned Bristol exterior/natural clay interior stoneware (1890-1915) and a single undecorated white-whiteware rim sherd (post-1890) were found. The only architectural element recovered was a single piece of window glass measuring 2.2 mm in thickness. A side-seamed tin can fragment completes the assemblage. The 12 artifacts in this assemblage which can be associated with ranges of use dates suggest that the site was occupied at most between 1880 and 1942, with average beginning and ending dates of 1893 and 1944, respectively. The preponderance of domestic tableware and storage items (n=13, 81.3 percent), coupled with furnishings (n=1, 6.3 percent) and architectural remains (n=2, 12.5 percent), strongly suggest a domicile.

Site History

As part of GMI's initial assessment of the cultural resources of the LHAAP, site 41HS539 (at that time designated Locality 4 or Archival Site D) was chosen for deed/title research and an examination of the census records and tax rolls (Peter and Stiles-Hanson 1990:Appendix A). The following paragraphs present the results of that work as reported in 1990 (Peter and Stiles-Hanson 1990:26):

Locality 4 [*i.e.*, site 41HS539] is situated within the C. Fuller survey which was patented in 1848. This southern portion of the Fuller estate was sold to W.C. and J.M. Swanson in November of 1848. The tax rolls for 1849 reveal that the Swanson family, led by Peter Swanson, owned over 9,600 acres within Harrison County. In addition, Peter Swanson is listed as owning 54 slaves, 17 horses, 75 cattle, wagons, sheep, and hogs. This property within the C. Fuller survey was likely an additional holding where only outbuildings or slave quarters were present. In 1850 the property was transferred to the trust of Swanson's grandson, James Edward Doty Blades.

In 1870 the property again changed hands. A.B. and Eliza Waskom took ownership of the survey. In 1895, eighty seven [*sic*] acres in the southern portion of the survey is transferred [*sic*] to Thomas Ruffin. Although the present research found no definitive evidence regarding the establishment of a housesite within this survey tract, it is most likely that actual residence of the property was initiated between 1870 and 1900. Discussions with Tom Brantley, Forester for LHAAP, have revealed that a grist mill was likely present at this locality. This property remained in the control of the Ruffin family until the U.S. government acquired it in 1942.

The Eliza Waskom mentioned in the 1870 transaction was "Eliza James [?] Waskom, nee Swanson" (Peter and Stiles-Hanson 1990:70) and apparently was an heir of Peter Swanson with a ½ interest in the 240 acres of the Fuller Survey. In the 1895 transaction, the wife of A.B. Waskom is listed as Sue A. Waskom and was possibly a second wife, Eliza Waskom having died in the intervening 25 years. Thomas Ruffin held the property until his death in 1912, at which time it was divided between his heirs (Peter and Stiles-Hanson 1990:70), with site 41HS539 probably being either in Block 4 (bequeathed to Mary Patterson), Block 5 (bequeathed to Matilda Ruffin), or Block 6 (bequeathed to Queen Blatt). Apparently, all of these blocks were held by the heirs of Thomas Ruffin until their sale to the U.S. government in 1942.

Summary

Site 41HS539 is a large, low density historic homestead site, apparently initially occupied in the late nineteenth century, and probably abandoned at the time that the LHAAP was constructed in 1942. It was definitely occupied by 1913, as a structure in the location of site 41HS539 appears on an early soil survey of that date from Harrison County (Van Duyne and Byers 1913). The average beginning date based on the artifactual materials recovered from the site (1893) agrees quite well with the date of sale of the property to Thomas Ruffin (1895) and suggests that Ruffin may have been the original occupant of the site. Since one of his heirs probably continued to hold the property following his death around 1912, it is quite probable that the site continued to be occupied until 1942, as suggested by the artifact assemblage. A domestic function for the site is suggested by the nature of the artifact assemblage recovered from the shovel tests, although no trace was found of a house foundation, possibly due to bulldozing or destruction of any standing buildings in 1942. If the brick structure, Feature 1, is a well housing, as the survey crew suggested, it would also support a domestic function for the site. However, if Feature 1 is the remains of a steam-powered sawmill, then 41HS539 may have been a rural industrial site, as well as or instead of a domestic site. The suggested presence of a grist mill in the area (Peter and Stiles-Hanson 1990:26) may also be related to an industrial function for site 41HS539.

On the basis of the information collected by the present investigations, the subsurface historical remains at site 41HS539 appear to have good contextual integrity. Although the A horizon has been removed over the majority of the site area, due either to natural or artificial causes, the shovel tests showed that intact historical deposits remain on the site. The underlying E horizon has been impacted to an unknown, but probably variable, extent and ranges from being almost nonexistent just off the southern edge of the site

to probably being largely preserved in the site center. Artifacts were generally recovered no deeper than 20 cm below surface, except in a few areas where artifacts were recovered between 20 and 40 cm. Five of the nine onsite shovel tests contained subsurface remains, and a relatively large number of artifacts were noted on the site surface and along the light-duty road on the eastern edge of the site (see Figure 6). A possible well housing or steam-powered sawmill (Feature 1) was located in the south-central site area. Good archival data was collected on the site during an earlier stage of investigations at the LHAAP, and more probably can be obtained (such as a 1912 will and probate records for Thomas Ruffin). Thus, despite what appears to be a relatively late date (post-1895), site 41HS539 may have some potential for yielding data important for our understanding of lifestyles and material culture of late nineteenth century, small landowners in deep East Texas. Therefore, it is recommended that site 41HS539 be considered potentially eligible for inclusion in the NRHP and further research be carried out to complete a determination of eligibility.

Site 41HS540

Site 41HS540 is an historical site located on an upland edge overlooking a small, unnamed tributary flowing north and then west into Harrison Bayou (see Figure 3). The site is situated at an elevation of approximately 67-70 m (200-210 ft) amsl and covers an estimated area of about 4,000 m² (ca. 95 m northwest-southeast x 55 m northeast-southwest; Figure 7). The site area is mapped as being on Eastwood very fine sandy loam, 5 to 30 percent slopes, near the boundary with the Metcalf-Cart complex, 0 to 2 percent slopes (Golden 1988). Eastwood very fine sandy loam is a "deep, moderately well drained, very slowly permeable soil, formed in unconsolidated shaly marine sediments, mainly of the Wilcox geology" (Golden 1988). It typically consists of an 8-cm thick A horizon of dark yellowish brown (10YR 4/4) loam overlying a 12-cm thick EB horizon of light yellowish brown (10YR 6/4) and strong brown (7.5YR 5/6) loam. The Bt subsoil generally consists of a red (2.5YR 4/6) clay more than 20 cm below ground surface. Metcalf soils consist of "deep, somewhat poorly drained, very slowly permeable soils that formed in thin loamy sediments over clayey deposits," while Cart series soils are deep, well drained, moderately slowly permeable soils "formed in loamy windblown and alluvial sediments" (Golden 1988). Metcalf soils typically consist of an 8-cm thick A horizon of dark grayish brown (10YR 4/2) silt loam, over a 12-cm thick E horizon of light yellowish brown (10YR 6/4) silt loam, over a Bt horizon of yellowish brown (10YR 5/4 - 5/6) loam or clay loam deeper than 20 cm. Cart series soils typically consist of a 10-cm thick brown (10YR 4/3) A horizon, over a 48-cm thick yellowish brown (10YR 5/4 - 6/4) E horizon, over a yellowish red (5YR 4/6) to strong brown (7.5YR 5/6 - 5/8) loam or clay loam below 58 cm. The site is covered by a mixed pine/hardwood forest consisting of moderately dense pine, oak, bois d'arc, hackberry, and elm, while the understory consists of sweetgum, maple, and pin oak saplings and honeysuckle. In addition, redbuds and two pecans were observed in the site area. The site is within the Eroded Uplands zone (Zone 3) of Peter and Stiles-Hanson (1990) but is not far from their Zone 4: Alluvial Bottomlands (see Table 1). The landform containing the site is very level, with recent rains creating a large pond of water, estimated at around 0.2 ha (90.5 acres) to the north of the site. Disturbances noted to the site area included deflation, an abandoned two-track in the western part of the site, and possibly bulldozing.

Eight shovel tests were excavated in the vicinity of site 41HS540, seven are located within the estimated site boundary, which is based on the distribution of surface artifacts and ornamental plants as well as the shovel tests (see Figure 7). Three of these shovel tests proved to be positive and yielded 14 historic artifacts, for an average of 2.0 artifacts per onsite shovel test. In general, the shovel tests revealed an A horizon of brown (10YR 5/3) fine sandy loam, an E horizon of yellowish brown (10YR 5/4) to light yellowish brown (10YR 6/4) fine sand or fine sandy loam, and a Bt subsoil of brownish yellow (10YR 6/6) silty clay or clay; a profile which seems to best fit the Metcalf series soils. The A horizon was apparently present only in Shovel Test 1, where it was less than 20 cm thick. The E horizon could be identified in

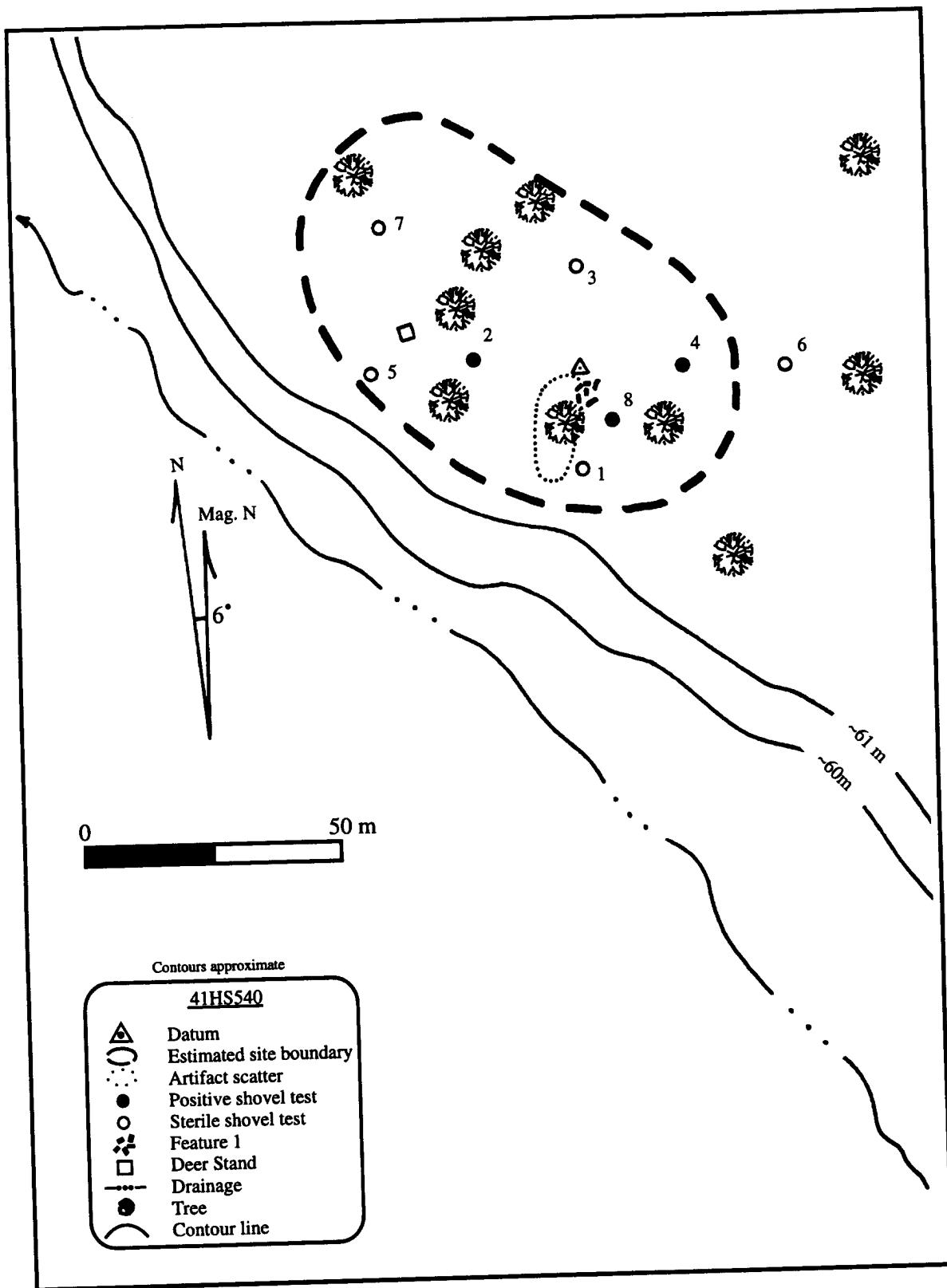


Figure 7. Plan map of site 41HS540, Longhorn Army Ammunition Plant, Harrison County, Texas.

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most of the shovel tests, and was generally between about 20 and 30 cm thick. At its shallowest, it was only 5 cm thick (Shovel Test 7), and at its deepest, it was 40 cm thick (Shovel Test 8); while in Shovel 6, it was not present at all. The general lack of an A horizon and the variable thickness of the E horizon probably reflects the degree of disturbance noted at the site.

A single feature was identified on the surface of site 41HS540 (Feature 1 on Figure 7). This consisted of a pile of hand-made, red brick, approximately 1 x 2 m in size, in the south-central site area, south of the datum. A two-gallon metal bucket was noted on the surface of the site near Feature 1, while a piece of strap metal, measuring 100 cm x 3 cm x 1 cm was noted projecting from the feature. In addition, a 2 m-long "U"-shaped piece of strap metal, which may be a part from a piece of farm machinery, was found protruding from the ground approximately 8 m south of Feature 1.

Artifacts

Fourteen historic artifacts were recovered from subsurface contexts at site 41HS540, all of which consisted of glass and metal (see Appendix C). The assemblage was dominated by domestic storage items (n=7, 50 percent), with architectural items and furnishings next most frequent (n=3, 21 percent for each category). The remaining artifact was a fragment of flat, thin metal of indeterminate function. The overall nature of this assemblage, coupled with the lack of domestic tableware, suggests a nondomestic function for the site.

The assemblage from site 41HS540 includes a fragment of a translucent milk glass, fruit jar inset cap embossed with "ENUINE B." The rest of the inset cap would have read "GENUINE BOYD PORCELAIN LINED" and it dates from 1900 to 1950. Two small, slightly solarized manganese decolorized lamp globe sherds and another clear lamp globe sherd make up the remainder of the glass materials recovered. Two whole wire 6d nails and one broken wire nail (post-1880) make up the architectural materials found. Five pieces of a tin can were also recovered along with the piece of thin, flat metal that could not be definitely attributed to a tin can. The overall range of use dates for these items suggests a maximum range of occupation of 1880 to 1942, with an average beginning date of 1889 and an average termination date of 1971 (too late for the latest possible termination date of 1942).

Site History

As was the case for site 41HS539, as part of GMI's initial assessment of the cultural resources of the LHAAP, site 41HS540 (at that time designated Locality 5 or Archival Site E) was chosen for deed/title research and an examination of the census records and tax rolls (Peter and Stiles-Hanson 1990:Appendix A). The following paragraph presents the results of that work as reported in 1990 (Peter and Stiles-Hanson 1990:26):

Locality 5 [*i.e.*, site 41HS540] shares a history of transfers with Locality 4 [*i.e.*, site 41HS539] through 1912. It is only then that the Ruffin family sells [*sic*] blocks 1, 2, and 3 to W.E. Webster. As many other landowners within the area, Webster sold his holdings to T.J. Taylor in 1919.

The chain-of-title presented by Peter and Stiles-Hanson (1990:Appendix A) shows that Thomas Ruffin, Jr., is given the block on which site 41HS540 is situated by his brother, Louis Ruffin. Since both presumably would have been heirs of Thomas Ruffin, this gift was probably part of an estate settlement. Seventeen days later, Thomas Ruffin, along with Allen Lee and his wife Savannah Lee (other heirs of Thomas

Ruffin?) sold Blocks 1, 2, and 3 from the estate (totalling 46½ acres) to W.E. Webster for \$465. This price was equivalent to \$10 an acre, suggesting that this was improved land, possibly with standing structures. Seven years later, Webster sold the blocks to S.J. Taylor for \$930 (or \$20 an acre); a price reflective both of the property's continued status as improved land and of the inflated land prices following the end of World War I. Taylor held the blocks until their sale to the U.S. government in 1942 for \$500 (equivalent to \$10.75/acre).

Summary

Site 41HS540 is a relatively small, low density historic archeological site which appears to have been in use from the late nineteenth century onward. The assemblage recovered from the site is relatively small but suggests that the site may not have been a domestic one. A structure is shown in the location of site 41HS540 on the 1913 soil survey map for Harrison County (Van Duyne and Byers 1913), so the site was apparently in existence at that time. The artifacts suggest that the site was in existence from around 1890 to 1942, but it may date as early as 1880. Thomas Ruffin obtained the property on which the site is located from the heirs of Peter Swanson in 1895 for \$4 an acre, and the site may have been constructed about the same time or shortly thereafter. Since the site was sold within a year of Ruffin's death in 1912, and since site 41HS539 remained in the family for another 30 years, it is likely that site 41HS540 was not the Ruffin homeplace. The sale price of \$10 an acre in 1912 for the blocks containing site 41HS540 does suggest improved property, but it leaves open the question of whether the improvements were domestic structures or outbuildings. However, if site 41HS540 was a domestic site, it was probably not occupied by the landowner at any time.

On the basis of the information collected by the present investigations, the subsurface historic remains at site 41HS540 appear to retain only a poor to fair contextual integrity. The A horizon has been removed over the majority of the site area, due either to natural or artificial causes, while the underlying E horizon has been impacted to a varying degree which ranges from being almost gone on the western side of the site to 40 cm thick on the east. Artifacts were generally recovered no deeper than 20 cm below surface, except in Shovel Test 8, where material went down to 40 cm below surface. This shovel test also contained the most artifactual remains (n=9), largely due to the presence of five fragments of tin can in Level 2 (see Appendix C). Only three of the seven onsite shovel tests contained subsurface remains and the density was moderately low. No intact or partially intact features were found on the site, although a pile of bricks was noted in the south-central site area (Feature 1). The overall site area was judged to have been impacted by bulldozing at some time in the past. These problems with the contextual integrity of the site, coupled with the possibility that 41HS540 was not a domestic site, seems to limit the site's potential for yielding data important for our understanding of lifestyles and material culture of late nineteenth and early twentieth century East Texas. Therefore, it is recommended that site 41HS540 be considered ineligible for inclusion in the NRHP and no further research be carried out at the site.

DESCRIPTIONS OF LOCALITIES

Five nonsite localities were identified during the 1993 cultural resources survey of the LHAAP, each of which was assigned a number at the time of location. As noted in the previous chapter, by definition no locality is considered to be eligible for inclusion in the NRHP.

Locality 1

Locality 1 is a surface scatter of historic material located adjacent to the northern border of MU 17 in Area 2 (Figure 8). It is situated along a flat, upland surface, on Metcalf-Cart complex soils, with a gentle 1 percent slope to the southeast, at an elevation of approximately 67-70 m (200-210 ft) amsl. The area is covered with a mixed pine/hardwood forest, including large pin oak trees and pin oak saplings. The artifact scatter consisted of a metal washtub; a broken, one-quart *Atlas* fruit jar; a piece of milk glass rim sherd (probably from a wide-mouthed bowl); and a pressed glass, kerosene lamp base. Five shovel tests were excavated in the area of this artifact scatter, but no subsurface remains could be located. No artifacts were collected.

Locality 2

Locality 2 consisted of a single prehistoric flake recovered from a survey shovel test located near the northern edge of MU 16 in Area 2 (see Figure 8). This locality is situated on a rise on the edge of what appeared to be an old terrace associated with the former channel of Martins Bayou, above a 4-m high cutbank. Martins Bayou presently occupies an artificial channel which forms the boundary between MU 16 and MU 17, and is approximately 100 m north of the former channel. The area of Locality 2 is at an elevation of approximately 65-67 m (195-200 ft) amsl, on what is mapped as Eastwood very fine sandy loam, 1 to 5 percent slopes (Golden 1988). The landform has a gentle 2 to 3 percent slope to the southeast and west, and the area is covered with an open woodland consisting of pine, white oak, and hickory, with minimal underbrush of French mulberry and briars. Twelve shovel tests were located along this landform, only one of which yielded any artifacts. The single artifact recovered was a red chert bifacial thinning flake within 20 cm of ground surface (see Appendix B).

Locality 3

Locality 3 is an apparent historic artifact dump area located adjacent to Avenue Q in the southwestern portion of MU 16 in Area 2 (see Figure 8). The locality is situated on a flat upland surface at an elevation of approximately 67-70 m (200-210 ft) amsl on what is mapped as being Scottsville very fine sandy loam, 0 to 2 percent slopes (Golden 1988). The area is covered by a mixed pine/hardwood forest, with a dense underbrush of sweetgum and pine saplings, briars, and goldenrod. Locality 3 was found immediately outside the cleared right-of-way for Avenue Q just inside the uncleared area. Surface remains in this area included two very large, broken concrete blocks (ca. 2 m x 2 m x 3 m) with metal rebar protruding. Also noted were a machine-made brick marked "*Made in USA Trademark Belden*," a chrome headlamp ring (circa 1940s), a piece of lead water pipe, a broken open-end wrench, burned glass, curved clear glass (possibly from an automobile headlamp), wire, and assorted gasket materials. Five shovel tests were excavated around these remains, only one of which yielded any cultural material. This single test yielded seven historic artifacts, including both glass and metal fragments. The glass consisted of two pieces of ABM (automated bottle machine; post-1910) bottle/jar glass, one large blob of melted aqua glass, and one piece of window glass (2.4 mm thick). The metal artifacts consisted of a single broken wire nail fragment (post-1880; shank only) and the head of a very large socket wrench. All of this material was recovered within 20 cm of the present ground surface, suggesting a localized dump area. These artifacts indicate a nonspecific twentieth century date, but the remains were probably deposited subsequent to the construction of the LHAAP.

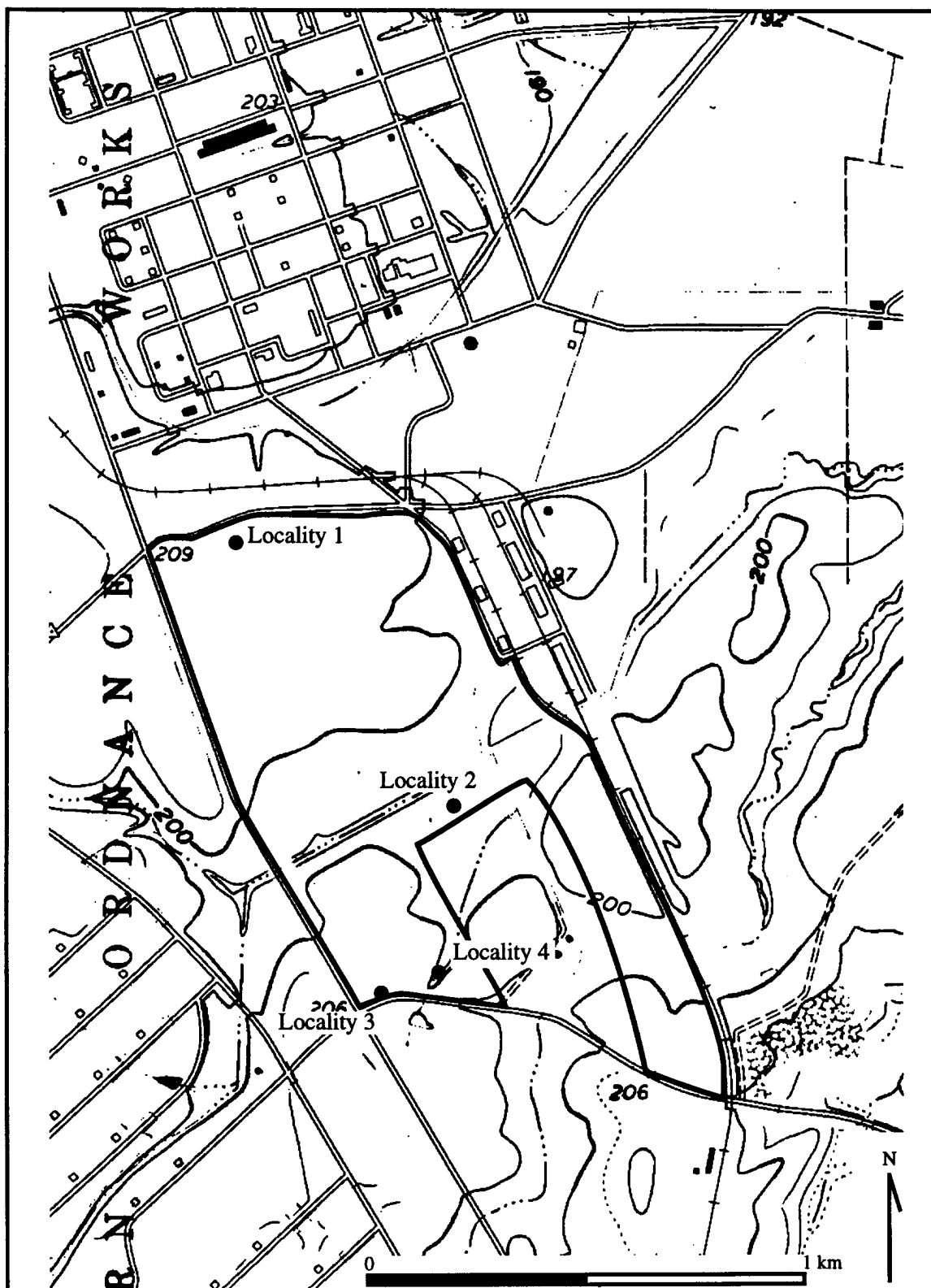


Figure 8. Map of MU 16 and MU 17 showing locations of Localities 1, 2, 3, and 4 recorded by the 1993 survey.

Locality 4

Locality 4 consists of a scatter of concrete blocks within the drainage of a small tributary of Martins Bayou near the southern edge of MU 16 in Area 2 (see Figure 8). The remains were found at an elevation of approximately 65-67 m (190-200 ft) amsl, on a small knoll and across a shallow drainage, in a moderately dense mixed pine/hardwood forest, on what is mapped as being Eastwood very fine sandy loam, 1 to 5 percent slopes (Golden 1988). The locality consists of an approximately 30 m x 40 m scatter of angular concrete blocks, some with broken and twisted rebar projecting. One large block (ca. 100 m x 60 cm) had a vertical metal pipe, 2.5 m long and 15 cm (6 in) in diameter, and a large eye-hook or tie-down imbedded in it. Three shovel tests were excavated in this area, but no subsurface remains were located. Locality 4 is probably a dump associated with the operation of the LHAAP.

Locality 5

Locality 5 consists of a single prehistoric flake and an historic artifact recovered from a small natural rise near the eastern border of MU 8 or Area 3 (Figure 9). The rise on which Locality 5 is situated measures approximately 6 m x 7 m across and is located at about 62-65 m (180-190 ft) amsl in the floodplain of "Goose Prairie Bayou," a small channelized drainage which flows into Goose Prairie to the north. The area was covered with pin oaks, briars, and rattan, and the soil is mapped as belonging to the Sardis-Mathiston loams, frequently flooded. Seven shovel tests were excavated at Locality 5, but only one yielded any cultural remains. The recovered material consisted of a gray quartzite secondary flake and a lead ball (fire arms projectile) within 20 cm of the surface. The ball measures approximately 12.9 cm in diameter. It still maintains its circular shape but has been battered and flattened a bit. It was identified as being approximately .44 caliber by one of the crew members and probably represents recent black powder hunting.

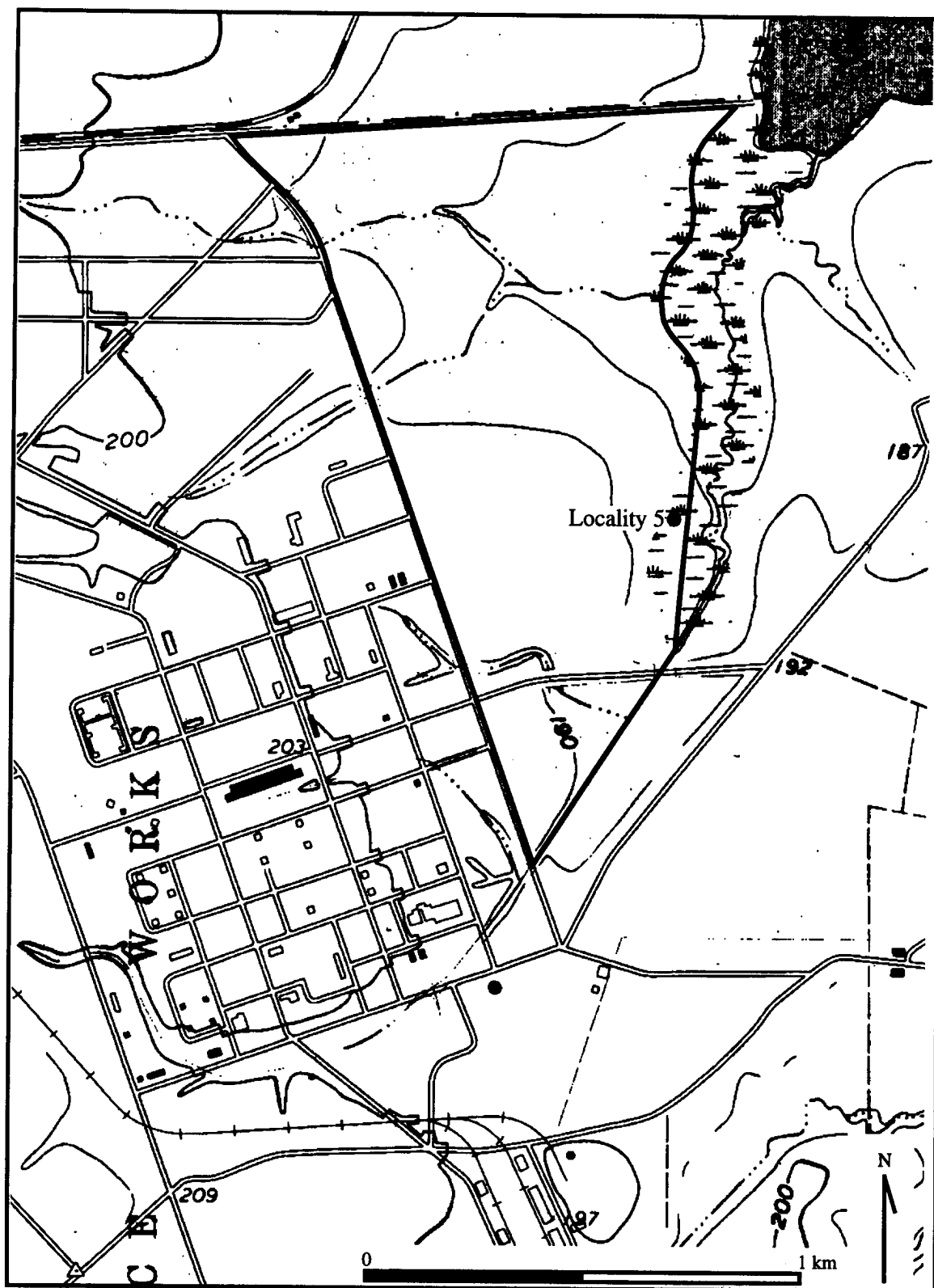


Figure 9. Map of MU 8 showing location of Locality 5 recorded by the 1993 survey.

CHAPTER 5

SUMMARY AND RECOMMENDATIONS

A discussion and assessment of the National Register of Historic Places (NRHP) eligibility of the cultural properties recorded during the 1993 survey of portions of the Longhorn Army Ammunition Plant (LHAAP) was presented along with the description of each property in Chapter 4. The present chapter is intended to present a more detailed discussion of the NRHP criteria and a summary of the assessments of all of the identified cultural properties in relation to their potential for fulfilling these criteria. In addition, the recommendations for the future treatment of these resources, initially presented in the previous chapter, are summarized.

COMMENTS ON NRHP ELIGIBILITY CRITERIA

Full assessment of NRHP potential admittedly is, in some cases, preliminary at this phase of investigations at the LHAAP, but each property may be evaluated in relation to the criteria set forth in 36 CFR § 60.4. Of particular importance is the requirement that an archeological property nominated to the NRHP be capable of yielding information important to our understanding of prehistory or history. In order to identify the types of information which may be considered important for this purpose, several previous reviews of relevant research problems may be consulted. Beginning with the most general, the Department of Antiquities Protection (DAP) of the Texas Historical Commission (THC) has identified five broad, regional contexts, or research themes, as having priority for prehistoric studies in Northeast Texas (Kenmotsu and Pertulla 1993). These are:

- Environmental Change during the Holocene,
- The Emergence of Sedentism,
- Changes in Hunter/Gatherer Mobility,
- The Development of Agriculture Prior to A.D. 1600, and
- The Effect of European Contact on Native and Immigrant Indians.

At the same time, the Advisory Committee to the National Register Programs Committee has identified nine broad state historic contexts, or research themes, for the historic period throughout Texas as a whole (Jones 1990). These include:

- Agriculture (1680-1945),
- Arts (1680-1945),

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- Community and Regional Development (1680-1945),
- Exploration and Settlement (ca. 1533-1945),
- Military (1533-1945),
- Natural Resources Exploitation and Development (1628-1945),
- Politics and Government (1680-1945),
- Transportation (1533-1945), and
- Education (1680-1945).

In addition, several more specific research designs which previously have been developed for other portions of Northeast Texas (Peter et al. 1989, 1990) also include research problems which are applicable to the LHAAP, at the regional, local, and plant-specific levels. These problems include:

- Site Detection,
- Paleoenvironmental Reconstruction,
- Culture History,
- Prehistoric Settlement-Subsistence Systems,
- Prehistoric Lithic Raw Material Use Patterns,
- Prehistoric Technology,
- Historic Period Native American Sites,
- Upland and Lowland South Settlement-Subsistence Patterns during the Historic Period,
- The Historic Lumber Industry,
- Historic Community Patterning, and
- The Role of Historic Transportation Systems during the Historic Period.

Finally, for the LHAAP itself, an assessment of the cultural resources within the plant was produced for the U.S. Army Corps of Engineers, Fort Worth District, in 1990 (Peter and Stiles-Hanson 1990). While this document does not constitute a specific research design for the LHAAP, it does summarize both the known and potential cultural resources within the plant as of 1988, present detailed background information on the prehistory and history of the area, and make recommendations for the future treatment of the resources at the LHAAP. Furthermore, it also touches implicitly on some regional research problems which the cultural resource data base at the LHAAP may be expected to relate to. These include:

- Changing Prehistoric Land-Use Patterns in Response to the Formation of Caddo Lake,
- Mid-Nineteenth Century Anglo-American Settlement and Plantation Farming,
- Late Nineteenth and Early Twentieth Century Rural Land-Use Patterns and Community Development,
- Nineteenth Century Rural Industrial Development, and
- Survival Strategies of Rural Populations during the Great Depression of the 1930s.

The first criterion of significance for any archeological property within the LHAAP is its capacity for yielding information relevant to one of the research themes set forth by the DAP above. In addition, the following criterion have also been applied to facilitate the evaluation of cultural resources within the LHAAP:

- (1) potential for interpretation of culture history or local sequences,
- (2) potential for interpretation of intersite or intrasite patterning,
- (3) potential for interpretation of technology or primitive industries, and/or
- (4) existence as an example of a unique or rare site type.

Whether or not specific properties exhibit such potential or contain data relevant to any particular research theme is dependent upon a precondition of contextual integrity of the archeological deposits. For example, a prehistoric site which was buried by sediment within the floodplain of Harrison Bayou or Martins Bayou has a far greater potential for containing undisturbed deposits than one located on a nonaggrading upland surface. However, the nature of contextual integrity, as it affects research potential of a property, must also be viewed as being relative since different research problems require different types of data.

The LHAAP survey methodology was designed to provide a preliminary assessment of:

- (1) the content of the cultural deposits (i.e., the range of artifactual and feature information available on the site);
- (2) the integrity of the cultural deposits (i.e., is the site undisturbed, bioturbated, deflated, etc.); and
- (3) the context of the cultural deposits (i.e., how does the site relate to both the natural and cultural environment of the appropriate time period).

The fundamental information derived from the survey was used to evaluate the sites and their potential for increasing our knowledge of past lifeways, contributing to the resolution of regionally pertinent research questions, or containing information relevant to any of the above research themes or problems. The research themes which seem most relevant to the single prehistoric property recorded by the current LHAAP survey are:

- (1) Culture History,
- (2) Prehistoric Settlement-Subsistence Systems,
- (3) Prehistoric Lithic Raw Material Use Patterns,
- (4) Prehistoric Technology, and
- (5) Changing Prehistoric Land-Use Patterns in Response to the Formation of Caddo Lake.

The research themes which seem relevant to the historic components are:

- (6) Late Nineteenth and Early Twentieth Century Rural Land-Use Patterns and Community Development, and
- (7) Survival Strategies of Rural Populations during the Great Depression of the 1930s.

Pertinent research questions for the prehistoric period include:

- What is the potential of the area for contributing information critical to our understanding of paleoenvironmental shifts in Northeast Texas?
- Can the time frame for localized developments, such as the beginning of incipient agriculture and the development of sedentism, be refined through the use of radiocarbon dates, cultural stratification, single component deposits, horizontal separation of components, or other methods of chronological control?
- Can in situ prehistoric and early historic deposits dating to the Archaic and Caddoan periods which can provide data for the reconstruction of settlement-subsistence patterns (e.g., topographic and environmental parameters, variety and abundance of food residue, functional variability of tool and ceramic assemblages, intersite variability of subsistence-related features and ceremonial structures, mortuary patterns, and bioarcheological data) be located?
- Do the late prehistoric sites in the LHAAP survey area represent a permanent Caddoan population residing in the area surrounding Caddo Lake or only temporary visits for resource extraction?
- Can interpretable patterns in changes in the frequency of local versus nonlocal lithic sources used in the production of stone tools be identified for all prehistoric periods present within the LHAAP?

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- Can temporal developments and influences from external sources within the region be recognized in the lithic technological variability from the LHAAP?
- Can the ceramic assemblages present at sites within the LHAAP be used to supplement a local ceramic chronology; and can they provide data on technological and stylistic variability which can in turn result in temporal and formal frameworks and regional synthetic research efforts?

Research questions relevant to the historic period sites include:

- How did the changing focus of the agricultural economy during the latter part of the nineteenth century affect the economic conditions and material life of white and black tenant farmers in the LHAAP?
- Did the focus of production on a cash crop affect land-use practices in this part of Harrison County during the late nineteenth/early twentieth century?
- How did the change from an antebellum plantation system based on slave labor to the late nineteenth century system based on tenant farmers and sharecroppers change the pattern of rural community settlement?
- How does the material culture of the three socioeconomic communities present in the area (large landholders, small landholders, and tenants or sharecroppers) change in response to the national and regional economic conditions of the late nineteenth and early twentieth centuries?
- Is there distinctive community patterning in the archeological record which is recognizable for each of the three socioeconomic groups present in the area?
- Is the black community as a sociocultural group recognizable archeologically within the larger community?
- What effect did rural industrialization (such as the development of the lumber industry) after 1870 have on the economy, settlement pattern, and patterns of consumption of the various ethnic groups residing within the LHAAP?

ARCHEOLOGICAL RESULTS OF THE 1993-1994 LHAAP SURVEY

As a result of the 1993 LHAAP survey, four cultural resource sites were located and recorded (or rerecorded), consisting of one prehistoric and three historic occupations (Table 6). All of these sites were located in the same general area (east of Harrison Bayou) and, with the exception of site 41HS539, all are roughly the same size (Table 7).

In addition to the cultural resource sites recorded by the 1993 LHAAP survey, five localities were noted. Three of these were historic in date, consisting largely of surface scatters or dumps related to pre-installation or installation activities. One locality was prehistoric in date and consisted of an isolated subsurface artifact. The final locality contained both historic and prehistoric remains, and consisted of an isolated artifact of both periods. By definition, all of these localities are ineligible for inclusion in the NRHP.

Prehistoric Settlement in the LHAAP Area

Unfortunately, the results of the 1993 LHAAP survey add very little new information to our knowledge of prehistoric settlement patterns in the LHAAP area. The only prehistoric site visited during this phase of research was the Harrison Bayou site (41HS240), already known as an important Archaic and Caddoan site, with a probable major occupation during the Late Caddoan Bossier phase (A.D. 1400-1500).

Table 6
Estimated Period of Occupation and Site Type, LHAAP Survey, 1993

Site	Estimated Periods of Occupation	Suggested Site Type ¹
41HS240	Archaic Formative Caddoan Bossier Phase Caddoan	Campsite Residence Site Residence Site
41HS396	Late 19th-Early 20th century	Non-Indian Residence Site (?)
41HS539	1895-1942	Non-Indian Residence Site and/or Industrial Site
41HS540	1895-1942	Non-Habitation Site

1 For the sake of consistency, the site types used follow the definitions presented in the Texas Antiquities Code (13 TAC §41.5).

Table 7
Summary of Cultural Resource Sites Recorded or Reevaluated by the 1993 LHAAP Survey

Site Number	Period of Occupation	Drainage	Estimated Site Area (m ²)	Subsurface Artifact Frequency	Total Number of Shovel Tests	Number of Onsite Shovel Tests	Average Artifact Density per Onsite Shovel Test
<u>Reevaluated Sites</u>							
41HS240	Prehistoric	Harrison Bayou	4,000	9	5	4	2.25
41HS396	Historic	Harrison Bayou	5,200	1	8	3	0.33
<u>Newly Recorded Sites</u>							
41HS539	Historic	Harrison Bayou	10,000	16	10	9	1.78
41HS540	Historic	Harrison Bayou	4,000	14	8	7	2.00

The identification of one prehistoric locality (Locality 2) on Martins Bayou, some distance from Caddo Lake, verifies the utilization of inland areas along this drainage away from the lake, but that is about all. Conversely, the location of Locality 5 near the mouth of "Goose Prairie Bayou" adds additional weight to a prehistoric presence in this area, which has already been recognized on the basis of previous survey work (Cliff and Peter 1992).

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Thus, the results of this survey support, and possibly supplement, the previous survey work at the LHAAP as presented by Cliff and Peter (1992):

- (1) The majority of the evidence of prehistoric utilization at the LHAAP is located in the northeastern portion of the plant; in, or adjacent to, what Gibson (1970) defined as the Lowland Cypress Fringe microenvironment and what Peter and Stiles-Hanson (1990) termed Alluvial Bottomlands.
- (2) Prehistoric occupations at the LHAAP were most common adjacent to Caddo Lake or very close to major drainages which flow into it; on upland slopes or first terraces near water (never more than 150 m away); the majority on or near Eastwood very fine sandy loam, but sometimes immediately adjacent to an expanse of floodplain soils.
- (3) On the basis of the present data from the LHAAP, the most intensive period of utilization (and probably occupation) was during the early part of the Late Caddoan period, probably by peoples of the Bossier phase (ca. A.D. 1400-1500).

Historic Settlement in the LHAAP Area

The results of the 1993 LHAAP survey in regard to historic settlement patterns are somewhat mixed, with the two new sites (41HS539 and 41HS540) increasing the sample of post-1890 sites but the previously recorded site 41HS396 remaining equivocal in regard to date and function. By and large, the new results change little in regard to previous conclusions concerning site location (Cliff and Peter 1992):

- (1) The historic period sites at the LHAAP are all located within Gibson's (1970) Mixed Hardwood-Pine Ridges and Hills microenvironmental zone; and within all the physiographic zones defined for the LHAAP by Peter and Stiles-Hanson (1990), suggesting that these zones, as defined, played little role in the choice of location for historic period sites.
- (2) The historic period sites vary in regard to their topographic situation, from being on level to gentle sloping uplands to first terraces above Caddo Lake or its primary and secondary drainages; and in regard to their distance to surface water (varying from 20 to 450 m) suggesting that cisterns, wells, or similar features must have supplied water to the majority of historic sites on the LHAAP.
- (3) The majority of the historic occupations at the LHAAP are located on, or at a contact with, Scottsville fine sandy loam or Eastwood fine sandy loam.

The new historical sites located by the present survey provide no additional information regarding the initial historic occupation period in the Caddo Lake vicinity (the early nineteenth century), nor does it add to our knowledge of the earliest period of historic occupation within the LHAAP itself (the 1870s). The identification of 41HS539 and 41HS540 does, however, increase the sample of sites initially occupied in the 1890s and associated with the hypothetical Elizabeth Church community in the southeastern portion of the LHAAP, which appears to modify the previous suggestion of a decline or retraction of the occupation in this area during this decade. However, the new results do not change the view that settlement in the southeastern portion of the plant area continued after 1900 and was relatively stable. Likewise, the new results do not change the view that subsequent to 1918, no new sites appear to have been founded in the LHAAP area, with the number of domestic occupations remaining stable during the 1920s and during the depression of the 1930s (Cliff and Peter 1992:166-170).

RECOMMENDATIONS

Of the four cultural resource properties located and recorded (or rerecorded) by the 1993 LHAAP survey, two (41HS396 and 41HS540) are presently recommended to be ineligible for inclusion in the NRHP (Table 8). Neither of these sites currently is felt to have much potential to contribute significant data important to our understanding of the historical period in Northeast Texas. In both cases, the ineligibility recommendation is largely based on their apparent inability to significantly increase our knowledge of the history of Northeast Texas and to properly address pertinent and appropriate research questions.

Table 8
National Register of Historic Places Assessment of Cultural Resource Properties
within the 1993 LHAAP Survey Area

Site	Density of Material ¹	Contextual Integrity ²	NRHP Assessment	Recommendations
41HS240	Low	Poor	Unknown	Collect additional data
41HS396	Low	Fair	Ineligible	No further work
41HS539	Low	Good	Unknown	Collect additional data
41HS540	Low	Fair	Ineligible	No further work

1 - Criteria for density categories:

High = Average subsurface artifact density within the site area equals more than 8 artifacts per shovel test.

Medium = Average subsurface artifact density ranges from 3 to less than 8 artifacts per shovel test.

Low = Average subsurface artifact density is less than 3 artifacts per shovel test.

2 - Criteria for levels of contextual integrity:

Excellent = Site judged to be largely intact; identifiable well preserved archeological features or deposits, with faunal preservation, buried stratified deposits, and/or intact spatial artifact patterning; minimal disturbance limited to bioturbation, peripheral erosion, or very limited human disturbance.

Good = Site judged to be largely intact; only identifiable disturbances due to bioturbation, erosion, and localized or limited cultural activity; possible intact artifact patterning; no evidence for subsurface features, faunal remains, or buried deposits.

Fair = Site judged to be only partially intact; several types of limited cultural disturbances may be present, including light-duty roads, fences, possible machine disturbance, erosion and deflation, and bioturbation.

Poor = Site judged to be only minimally intact; evidence of heavy disturbance or destruction of the site, due to bulldozing, earthmoving, erosion, or other processes.

Of the two sites which are presently felt to have an unknown potential for inclusion in the NRHP, one is the prehistoric Harrison Bayou site (41HS240). This site has played a significant role in the development of Caddoan archeology in East Texas and Louisiana, and at one time it apparently had a high artifact density, midden deposits, and a high research potential. Unfortunately, however, government activity within the last 20 to 30 years appears to have adversely affected it and at the present time it is unclear how much research potential remains to the site. It is possible that significant artifact samples may be recoverable from the approximately 15 percent of the topsoil remaining on the site, while subsoil features (if any are present) may not have been seriously impacted. In light of these possibilities, the site may still contain significant prehistoric archeological data, with a potential for adding to our knowledge of the prehistoric period in East Texas.

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The remaining site, 41HS539, is also felt to currently have a status of "eligibility unknown," based on the need for further evaluation of the archeological remains and deposits present at the site in order to reach a final determination of eligibility. Site 41HS539 appears to be an historical residence site, or possibly a rural industrial site, dating subsequent to 1895 on the basis of the shovel testing results and the presence of an apparent well housing or remains of a steam-powered sawmill. This site is felt to potentially contain significant archeological deposits dating to the historical period, with a potential for increasing our knowledge and understanding of rural lifestyles of this period, and may possess the contextual integrity required to address some of the research themes noted above.

Based on the data collected by the 1993 LHAAP survey and the assessment of the research potential for each site, a series of recommendations have been made for each cultural property (see Table 8). The preferred treatment for all potentially significant cultural properties within the LHAAP is preservation and protection, but it is recognized that this may not always be possible. For some sites preservation presents no problems; however, other sites may be in the path of planned or future activities on the LHAAP. At the present time, only one type of activity presents the most immediate possibility of impact for these cultural resource sites: timber harvesting.

Quoting from a cultural resource management plan developed for several similar Army installations elsewhere in Northeast Texas:

[t]imber harvesting is potentially damaging to cultural resource properties if skid trails or loading and logistical staging areas are placed on or near the site. Similarly, the removal of trees from a site in wet weather with a skid loader will leave ruts and generally disturb the site context (Peter et al. 1991:VI-3).

Both site 41HS240 and site 41HS539 have the potential of being disturbed by timber harvesting activities on the LHAAP. Therefore, certain procedures should be stringently followed to avoid damage to these sites:

- avoidance of the sites by ensuring that skid trails and loading and logistical staging areas are placed at least 50 feet from their marked boundaries, and
- avoidance of the sites by prohibiting use of tracked vehicles on their surfaces, and use of any vehicle during wet soil conditions. Downed trees will be removed from these properties with rubber-tired vehicles when the soil matrix is relatively dry and firm.

Other present or future activities which potentially may have long-term impacts on the cultural resource sites present within the LHAAP include:

- (1) plowing of existing fire lanes,
- (2) mowing and controlled burning,
- (3) unauthorized surface collection,
- (4) right-of-way easements,
- (5) environmental remediation,
- (6) oil and gas leases,
- (7) archeological site vandalism, and
- (8) excessing lands to a non-federal entity.

A Cultural Resources Management Plan for the LHAAP is currently being written, but until it is completed and put in place it is recommended that LHAAP personnel consult the existing management plan for the Red River Army Depot (RRAD) and Lone Star Army Ammunition Plant (LSAAP) to the north in Bowie

County (Peter et al. 1991). Definitions of each of these specific activities, as well as standard operating procedures for managing the cultural resources in each instance, are detailed in *Section VI, Subsections B and D* of that management plan (Peter et al. 1991).

In light of the future potential for these types of impacts to the cultural resource properties within the LHAAP, it is recommended that the NRHP evaluation process be completed for those sites (including 41HS240 and 41HS539) which are currently acknowledged to be of unknown eligibility for inclusion in the NRHP. The completion of the evaluation of these sites should involve test excavations as a means of evaluating the actual potential of each site to contribute to our understanding of prehistoric and historic lifeways in Northeast Texas and of providing information for the development of a preservation plan with the concurrence of the Texas State Historic Preservation Officer (SHPO). Following this, those sites which can be recognized as being eligible for inclusion in the NRHP should be nominated and protected from any further impacts.

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APPENDIX A
DEFINITIONS OF
PREHISTORIC LITHIC ARTIFACT CLASSES

FINISHED BIFACIAL TOOLS

These artifacts are formal tools which show evidence of working on both faces (in contrast to unifaces). A number of bifacial tools may be recognized but the most common are projectile points and thinned bifaces (knives).

Projectile Points

A projectile point is a bifacial tool formed by fine secondary retouch with basal modification in the form of notching, stemming, or thinning of the proximal end for purposes of hafting. This class includes arrow points, dart points, indeterminate points, and basal fragments (the latter only when the hafting element is present). All other fragments are included within the biface fragment class. Projectile points are subjectively separated into dart and arrow point subclasses on the basis of size, thickness, and weight and are assigned to defined types whenever possible.

Thinned Bifaces (knives)

Thinned bifaces are sufficiently whole, bifacially worked tools which exhibit biconvex symmetry in cross section, at least one edge formed by fine secondary retouch, and an absence of cortex except for the proximal end. These artifacts are commonly designated as knives in the literature.

UNFINISHED BIFACES

Early and Late Aborted Bifaces

Aborted bifaces are bifacially worked artifacts that appear to have been rejected prior to the completion of the bifacial reduction process. Early and Late stage subclasses are recognized.

Early Aborted Bifaces are those specimens which lack symmetry and exhibit sinuous edges formed by the removal of large, thick flakes. Cortex is usually present on at least one surface and areas of step or hinge fracturing may be evident.

Late Aborted Bifaces usually exhibit biconvex symmetry and straight edges. Generally, all cortex will have been removed, but the fine, pressure retouch characteristic of a thinned biface is not present.

Arrow and Dart Point Preforms

These are biface blanks which are symmetrically shaped and finished but which show no evidence of use-wear and no basal modification. Arrow point and dart point preforms are distinguished on the basis of size.

Unidentified Fragments

These specimens are bifacially worked pieces that cannot be placed in a more specific class because of their fragmentary nature.

UNIFACES

Unifaces are tools which exhibit retouch scars on one face only, and whose edges have been modified to varying degrees. Those specimens which have been minimally altered are grouped together as Marginally Modified/Retouched Pieces. The others are all formal tool types and exhibit the following characteristics: (1) a zone of regular, patterned retouch; (2) two or more rows of overlapping flake scars along the working edge; and, (3) an edge angle of greater than 50 degrees.

Marginally Modified/Retouched Pieces

Marginally modified/retouched unifaces are tools which show evidence of patterned and deliberate retouch but which do not fall into any other formal tool class. Tools included in this class are often characterized by: (1) a single row of flake scars forming an acute angle working edge (less than 50 degrees); and, (2) relatively small flake scars (less than 2 mm in width).

Endscrapers

These are steeply chipped unifaces with retouch restricted to the distal or proximal end of the blank; generally a convex working edge, and possibly marginal retouch along the lateral edges of the blank.

Sidescrapers

These steeply chipped unifaces have retouch present on one or both lateral edges of the blank, with a working edge which may be straight or convex.

Borers and Gravers

These are steeply chipped unifaces with small flakes removed along one lateral edge to form a tool for scoring or perforating.

Denticulates and Notches

These are steeply chipped unifaces with small flakes removed along one lateral edge to form a working edge that is serrated (denticulate) or a single concave area (notch).

UNMODIFIED LITHIC DEBRIS

Flakes

A flake must exhibit a platform and a bulb of percussion. If these attributes are missing, the specimen is classified as angular shatter. Flakes are subdivided into four categories:

- (1) Primary decortification, defined as having cortex covering more than 75 percent of the dorsal surface.

- (2) Secondary decortification, defined as having less than 75 percent of the dorsal surface covered with cortex.
- (3) Tertiary flake, defined as having no cortex on the dorsal surface.
- (4) Bifacial thinning flake, showing characteristics associated with the thinning of bifacial preforms or tools.

The relative size of each flake was also recorded. Six size categories were recognized, using U.S.A. Standard Testing Sieves (A.S.T.M. E-11 Specification):

- (1) >25.0 mm (> 1.0 inch)
- (2) 19.0 - 25.0 mm (0.750 - 1.0 in)
- (3) 12.5 - 19.0 mm (0.500 - 0.750 in)
- (4) 9.5 - 12.5 mm (0.375 - 0.500 in)
- (5) 6.3 - 9.5 mm (0.250 - 0.375 in)
- (6) <6.3 mm (<0.250 in)

UTILIZED DEBITAGE

These are informal unifacial tools which are assumed to reflect expedient use of unmodified flakes or lithic debris. They are often characterized by discontinuous or very abrupt retouch of a thin edge. The five categories of debris and six size classes listed above are also applied to utilized flakes.

CORES

A core is a cobble or mass of lithic material exhibiting scars which result from the systematic removal of flakes by human activity. Four primary subclasses of cores are distinguished.

Tested Nodules/Pebbles

These are pebbles or cobbles with one or very few flakes removed. They probably represent discards from an early, material-selection stage of the bifacial reduction process.

Bipolar Core

These are characteristic lozenge-, wedge-, or pillow-shaped cores resulting from the use of an anvil to rest the core against when striking it with a hammer, and showing indications of impact fractures on two opposing faces.

Discoidal Core

These are cobbles which have been bifacially reduced so that a disc-shaped core remains.

Blade Core

These are deliberately prepared cores from which blades or blade-like flakes, defined as being twice as long as they are wide, have been removed.

Fragment/Indeterminate

A broken portion of a core which is too fragmentary for identification.

GROUND, PECKED, OR BATTERED STONE

This artifact class includes those specimens shaped or modified by grinding, pecking, or battering. A number of subclasses can be recognized.

Hammerstones

These are nodules of lithic material, often quartzite, which exhibit battering on one or more edges.

Manos

These are ovate-shaped rocks, often of quartzite or sandstone, with one or more surfaces smoothed through grinding.

Metate/Grinding Slabs

Large, thick slabs, often of sandstone, which have been ground smooth on one or both surfaces. These surfaces may be flat or basin shaped.

UNWORKED STONE

Included in this artifact class manuports and burned rock. Manuports are nodules or cobbles which are not a natural part of the site context and which were presumably brought in by the occupants of the site, but which have not been altered.

Burned rock includes those cobbles or rock fragments which exhibit angular fractures, crazing, pot lid fractures, or discoloration by oxidation as a result of being heated. These rocks may have been used as boiling stones, griddles, or linings for earth ovens. The raw material may be limestone, sandstone, or quartzite.

APPENDIX B

**SUMMARY OF PREHISTORIC ARTIFACTS
RECOVERED FROM THE 1993-1994
LONGHORN ARMY AMMUNITION PLANT SURVEY**

Longhorn D.O. 12 - 1106-012
Prehistoric Artifact Data

Rec No.	Bag No.	Art No.	Group	Class	Type	Other	Material	Heat Treat.	Qty	Size(mm)	Weight (grams)
41HS240 Unit: Lev: 1											
14	3	1	CERAMIC	Ceramics/Clay	Baked Clay	N/A	N/A	N/A	1	L33xW26xT11	6.9
15	3	2	CERAMIC	Ceramics/Clay	Baked Clay	N/A	N/A	N/A	1	L22xW15xT10	2.2
13	26		LITHICS	Unmodified Debitage	Secondary Flake	N/A	Chert	no	1	6.3-9.5mm	0.4
41HS240 Unit: S.T. Lev: 1											
4	4		CERAMIC	Ceramics/Clay	Vessel/container	Body	N/A	N/A	1	L14xW10xT9	0.1
12	21		LITHICS	Unmodified Debitage	Tertiary Flake	N/A	Chert	no	1	<6.3mm	
41HS240 Unit: S.T. Lev: 2											
5	5	1	LITHICS	Unfinished Biface	Aborted, Early	Complete	Chert	no	1	L39xW23xT11	10.0
6	5	2	LITHICS	Unmodified Debitage	Bifacial Thin. Flake	N/A	Chert	no	1	<6.3mm	0.1
7	5	3	LITHICS	Unmodified Debitage	Secondary Flake	N/A	Chert	no	1	6.3-9.5mm	0.2
8	5	4	LITHICS	Unmodified Debitage	Secondary Flake	N/A	Chert	no	1	<6.3mm	0.2
10	19	1	CERAMIC	Ceramics/Clay	Vessel/container	Rim	N/A	N/A	1	L17xW15xT6	1.8
11	19	2	CERAMIC	Ceramics/Clay	Vessel/container	Body	N/A	N/A	1	L17xW12xT5	1.2
41HS240 Unit: S.T. Lev: 3											
3	6		CERAMIC	Ceramics/Clay	Vessel/container	Body	N/A	N/A	1	L30xW18xT7	3.7
LOC 2 Unit: S.T. Lev: 1											
9	1		LITHICS	Unmodified Debitage	Bifacial Thin. Flake	N/A	Chert	no	1	<6.3mm	0.1
LOC 5 Unit: S.T. Lev: 1											
1	27		LITHICS	Unmodified Debitage	Secondary Flake	N/A	Quartzite	no	1	6.3-9.5mm	0.7

APPENDIX C

**SUMMARY OF HISTORIC ARTIFACTS
RECOVERED FROM THE 1993-1994
LONGHORN ARMY AMMUNITION PLANT SURVEY**

Longhorn D.O. 12 - 1106-012
Historic Artifact Data

Rec No.	Bag No.	Art No.	Group	Class	Type	Other	Dates	Qty.	Family	Comment
41HS396 Unit: S.T. 1 Lev: 1										
1	2	1	HISTORIC	CERAMIC	Whiteware	H. BLUE TINTED	1880-1930	1	Domestic	SLIGHTLY BURNED
41HS539 Unit: S.T. 1 Lev: 1										
4	8	1	HISTORIC	GLASS	Milk Glass	OPAQUE JAR	1920-1964	1	Domestic	COSMETIC JAR; CONTINUOUS THREAD; LIP FINISH; HAZEL ATLAS MARK SIDE SEAM
2	18	1	HISTORIC	METAL	Iron	TIN CAN FRAGMENT	1897-1994	1	Domestic	
41HS539 Unit: S.T. 2 Lev: 1										
10	9	1	HISTORIC	CERAMIC	Stoneware	BRISTOL EXTERIOR/NATURAL CLAY INTERIOR	1890-1915	1	Domestic	SLIGHTLY BURNED
0	23	0	LITHICS	UNWGD STONE	Burned Rock	SANDSTONE		1	Architectural	Weight = 12.5 grams
5	25	1	HISTORIC	GLASS	Mang/Solar	BOTTLE	1880-1920	1	Domestic	
6	25	2	HISTORIC	GLASS	Mang/Solar	BOTTLE	1880-1920	2	Domestic	MELTED
7	25	3	HISTORIC	GLASS	Aqua	BOTTLE		1	Domestic	MELTED
8	25	4	HISTORIC	GLASS	Aqua	FRUIT JAR	1905-1935	2	Domestic	CONTINUOUS THREAD LIP; MELTED; CROSSMEND
9	25	5	HISTORIC	GLASS	Lt. Tint	WINDOW		1	Architectural	2.2MM
41HS539 Unit: S.T. 3 Lev: 2										
11	10	1	HISTORIC	CERAMIC	Whiteware	WHITE	1890-1994	1	Domestic	RIM SHERD
12	22	1	HISTORIC	GLASS	Clear	BOTTLE	1910-1994	1	Domestic	
41HS539 Unit: S.T. 6 Lev: 1										
13	11	1	HISTORIC	GLASS	Mang/Solar	BOTTLE	1880-1920	1	Domestic	
14	11	2	HISTORIC	GLASS	Clear	LAMP		1	Furnishing	GLOBE
41HS539 Unit: S.T. 7 Lev: 2										
3	12	1	HISTORIC	GLASS	Mang/Solar	BOTTLE	1880-1920	1	Domestic	

Longhorn D.O. 12 - 1106-012
Historic Artifact Data

Rec No.	Bag No.	Art No.	Group	Class	Type	Other	Dates	Qty.	Family	Comment
41HS540	Unit: S.T.	2	Lev: 1							
15	13	1	HISTORIC	GLASS	Clear	LAMP		1	Furnishing	GLOBE
41HS540	Unit: S.T.	4	Lev: 1							
19	14	1	HISTORIC	GLASS	Mang/Solar	BOTTLE	1880-1920	1	Domestic	
20	14	2	HISTORIC	GLASS	Milk Glass	FRUIT JAR	1900-1950	1	Domestic	FRUIT JAR; INSET CAP EMBOSSED W/"GENUINE 8"
21	14	3	HISTORIC	GLASS	Mang/Solar	LAMP	1880-1920	2	Furnishing	SLIGHTLY SOLARIZED
41HS540	Unit: S.T.	8	Lev: 1							
22	15	1	HISTORIC	METAL	Iron	FLAT, THIN		1	Indeterminate	
41HS540	Unit: S.T.	8	Lev: 2							
16	16	1	HISTORIC	METAL	Iron	WIRE NAIL	1880-1994	1	Architectural	BROKEN
17	16	2	HISTORIC	METAL	Iron	WIRE NAILS	1880-1994	2	Architectural	WHOLE 6D. (5.1MM)
18	16	3	HISTORIC	METAL	Iron	TIN CAN	1897-1994	5	Domestic	FRAGMENTARY
LOC 3	Unit: S.T.	1	Lev: 1							
27	7	1	HISTORIC	METAL	Iron	WRENCH		1	Activities	LARGE SOCKET
28	7	2	HISTORIC	METAL	Iron	WIRE NAIL	1880-1994	1	Architectural	BROKEN; SHANK ONLY
23	20	1	HISTORIC	GLASS	Clear	WINDOW		1	Architectural	2.4MM THICKNESS
24	20	2	HISTORIC	GLASS	Clear	BOTTLE	1910-1994	1	Domestic	ABM
25	20	3	HISTORIC	GLASS	Lt. Tint	BOTTLE	1915-1994	1	Domestic	ABM
26	20	4	HISTORIC	GLASS	Aqua			2	Indeterminate	MELTED
LOC 5	Unit: S.T.	1	Lev: 1							
29	17	1	HISTORIC	METAL	Lead	LEAD BALL		1	Activities	12.9CM DIAMETER